AMERICA'S LARGEST TEXTILE MONTHLY

COTTON

Entered as second-class matter at the postoffice, Dalton, Ga., under Act of March 3, 1879.

Volume 87
Number Three
$1.00 a Year.

JANUARY 1923

Published monthly by
W. R. C. Smith Publishing Co.
Dalton, and Atlanta, Ga.

"HARDEST, SMOOTHEST PORCELAIN IN THE WORLD"

ADAMANT

(*Reg. U. S. Pat. Office*)

PORCELAIN GUIDES

for

TEXTILE MACHINERY

The average manufacturer does not appreciate the enormous amount of damage that an imperfect guide can cause in the manufacture of textiles.

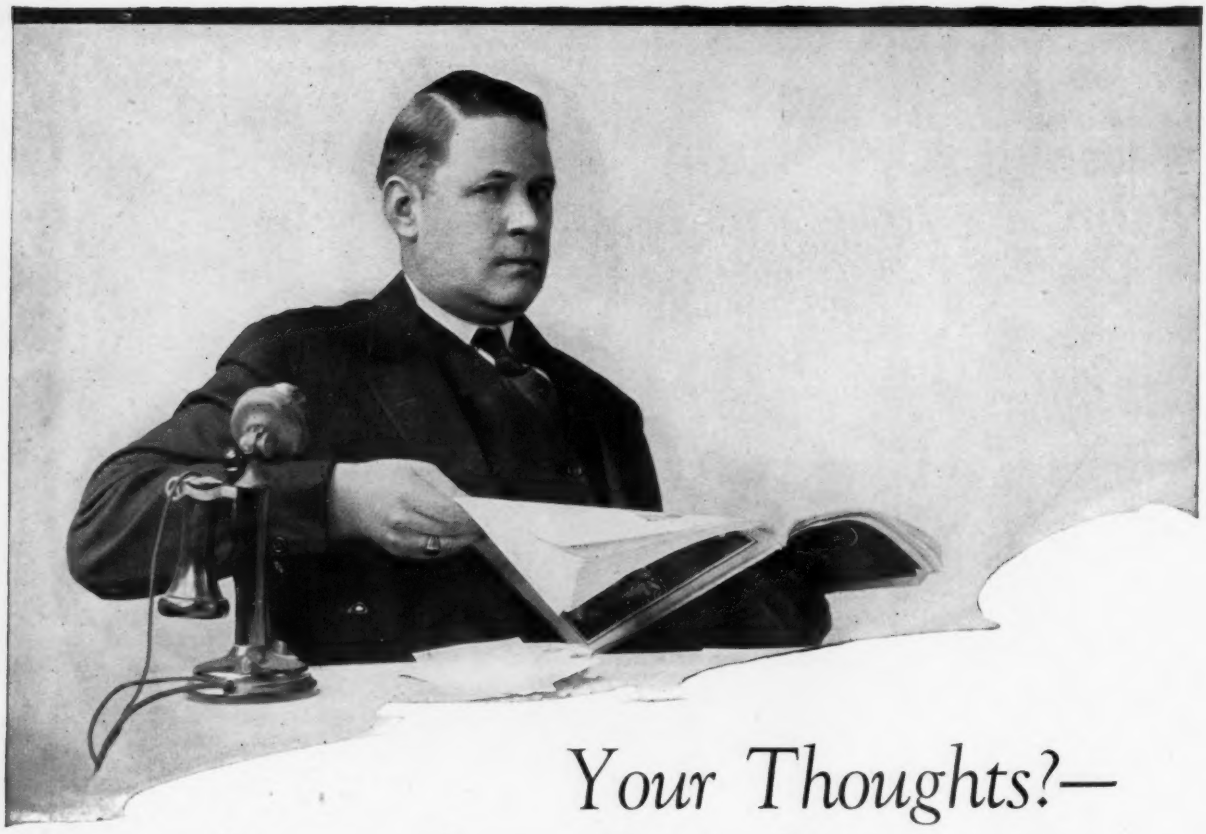
Mitchell-Bissell Co.

334 FOURTH AVENUE

NEW YORK

FACTORY, TRENTON, N. J.

Write for Catalogue



Your Thoughts?— after reading this advertisement

The Franklin Process Company has the largest yarn dyeing capacity in the United States. It dyes yarn in the wound form and handles all classes of colors from the cheapest to the best. It is also by far the largest user of fast Vat dyes.

The development of the Franklin Process Company has taken place within a comparatively few years. Such rapid growth from a small beginning is ample proof of the success and the popularity of the FRANKLIN PROCESS of dyeing.

We receive worsted yarn, both single and ply, on bobbins, tubes or cones, dye it on the Universal wound parallel tubes and return it on these tubes or on cones. We also receive worsted yarn on jackspools, dye it on our special perforated dyeing spools and return it to you on the original jackspools.

We receive cotton yarn on bobbins, tubes, cones or cops, dye it on Universal wound parallel tubes and return it to you without waste on these tubes or cones.

We also dye Merino yarn, silk noils, mohair yarn, cotton novelty yarns of all kinds and multiple wound yarns for insulating.

The Franklin Process of dyeing yarn in the wound form, eliminates skeins and warps with their attendant waste, which fact alone is the strongest of reasons for sending your work to one of our plants.

The quality of Franklin dyeing is almost universally recognized in the trade. The colors are distinctive and unusually brilliant.

What are your thoughts after reading this advertisement? Do you not think that the Franklin Process Company can be of service to you?

Complete information regarding the adaptability of Franklin Dyeing to your problem will be furnished on request.

FRANKLIN PROCESS CO.

Philadelphia PROVIDENCE Manchester, Eng.

New York Office, 72 Leonard Street

SOUTHERN FRANKLIN PROCESS CO.

Greenville, S. C.

WOULD YOU HESITATE TO SPEND $100,000

for Modern Machinery for your Mill if you could be shown that the *Annual Return* on the investment would be

24% PROFIT

That is exactly what a Mill Owner found he could do in a recent investigation made by his own manufacturing executives in co-operation with our experts. Only actual facts were used—not theories.

EXPERIENCE PROVES THE FACTS

This is not an isolated or unusual case. Investigations of actual results obtained over a period of years by mills that had both Common and Northrop Looms running in the same or adjoining Weave Rooms have shown even greater savings.

INCREASE THE PRODUCT PER MACHINE AND PER WORKER

and American Industry is safe—for the Manufacturer and for the Worker. To stick to old methods and old machines because they have sufficed until now is to endanger your prosperity. The load 20th Century business and industry carries under present conditions is too heavy for the old bridge that was once safe enough. Everywhere new bridges replace the old. To delay rebuilding is dangerous. *Oxen have gone; the Horse is going; the Automobile is here. The Hand Loom has gone; the Common Power Loom is going; the Automatic Loom is here.*

LET'S TALK IT OVER

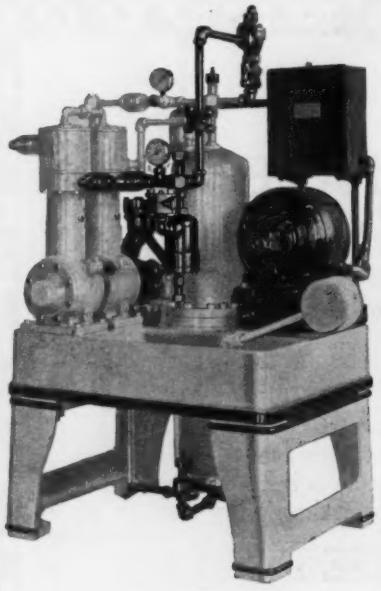
Our Salesmen and Experts are at your call. Draper Service may be had for the asking without obligations. You have been wondering if it wasn't time to begin scrapping some of the old machinery. Let's talk it over.

DRAPER CORPORATION

HOPEDALE MASSACHUSETTS

SOUTHERN OFFICE—ATLANTA GEORGIA

Copyright 1917 by Draper Corporation



The Varied Uses for An Automatic Refrigerating Machine

Lipman Automatic Refrigerating Machines are achieving wonderful success not only in the supplying of properly cooled drinking water for textile mills and industrial plants of all kinds, but in many and varied uses.

Some mills find it the most efficient and economical system for cooling and conserving food supplies, such as milk, butter, meats, etc., in their community stores and markets. Some use it in hospitals where it fills a long-felt need and where its automatic efficiency proves its superiority. Some mills and finishing plants find it the most valuable system for cooling the different chemicals used in the finishing and process of their goods in the dye house and finishing plant. In schools, in laboratories, in restaurants, florists' shops, hotels, soda founts, and even in private homes, you will find Lipman Automatic Refrigerating Machines giving a refrigerating, ice making and water cooling service that cannot be secured as efficiently, automatically and economically with any other machine or system.

ONLY WITH AUTOMATIC CONTROL is refrigeration satisfactory in the smaller installations, and the Lipman Automatic is therefore the only equipment that has proven satisfactory to textile mill and community usage. The automatic machine starts and stops at the exact pre-determined temperature and runs only as long as is necessary. They require no attention except an occasional oiling. They operate themselves Sundays and Holidays. And it is only with automatic operation that the most PERFECT and ECONOMICAL refrigeration can be secured. Temperature variations of 4 to 6 degrees is always maintained with a Lipman.

Whatever your requirements, a Lipman Automatic Refrigerating System can be supplied to more fully meet your conditions than anything else. Ask us today for booklet.

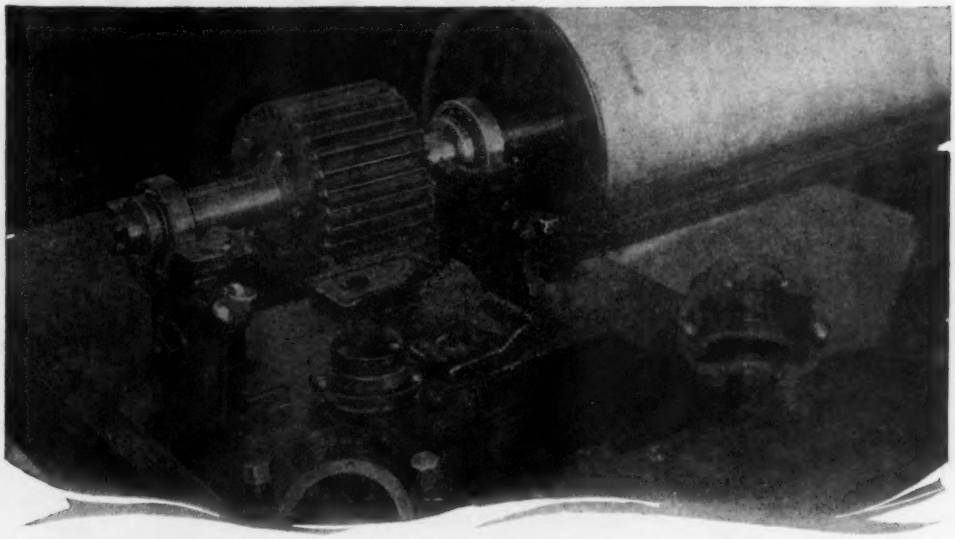
Miles Refrigerating Company

63-A Walton Street, Atlanta, Georgia

Lipman

FULL-AUTOMATIC REFRIGERATING MACHINES

SKF



Ball Bearings on Spinning-Frame Cylinders Reduce Vibration and Prolong Life of Parts

THE length of spinning and twisting frame cylinders and the lightness of the metal in the drum permit vibration, resulting in serious wear if ordinary bearings are used.

This wear gives rise to additional vibration which is augmented by the cast-iron heads pressed or soldered into the drum, and by the bands and tapes of the spindle drive at ordinary running speed. Broken drums, unevenness in the finished work and short machine life result.

When SKF marked self-aligning ball bearings are used to support the cylinder, vibration is greatly reduced and even after years of service no wear is discernible in the bearings and no increase in the small initial amount of vibration can be noticed.

The joint in the cylinder is kept tight, the shaft does not crystallize and the machine continues to give satisfactory service for years.

Let our engineers co-operate in changing over your present equipment.

THE SKAYEF BALL BEARING COMPANY

Supervised by SKF INDUSTRIES, INC., 165 Broadway, New York City

903

Normal View

Deflected View

BALL BEARINGS
The Highest Expression of the Bearing Principle

FAFNIR

Which Would You Rather Do?

YOU CAN KEEP THE PLAIN BEARINGS ON YOUR PICKERS AND CONTINUE TO WASTE POWER, PUT UP WITH REPAIRS MADE NECESSARY BY HEATING AND WEAR, SUFFER THE LOSS OF GOOD COTTON SOILED BY OIL, AND RUN THE RISK OF FIRES FROM HOT BEARINGS.

Or you can equip your beaters, fans and apron rolls with **Fafnir Ball Bearings** and avoid all these troubles.

Fafnir Ball Bearing Boxes are easily installed on all standard makes of pickers.

Fafnir Ball Bearings are made in all standard types and sizes, and all are manufactured with the utmost accuracy and finish from thoroughly heat treated (not case hardened) chrome alloy steel.

THE FAFNIR BEARING COMPANY

New Britain, Conn.

Southern Representative,

O. R. S. Pool, Box 1375, Greenville, S. C.

S. M. Smith,

P. O. Box 1423, Greensboro, N. C.

FAFNIR The Red Dragon Line

Daylighting Your Factory Office

Truscon Perfection Balanced Ventilator Windows are ideal for the industrial factory office. The ventilated sections operate entirely outside of the sash frame, so they do not interfere with shades and screens. The size and arrangement of the lights may be varied to meet the architectural requirements of the building. The units may be used singly or may be combined, affording continuous daylight bays.

The picture shown at the top of the page is the office of the Westinghouse Electric & Mfg. Co., Huntington, W. Va.

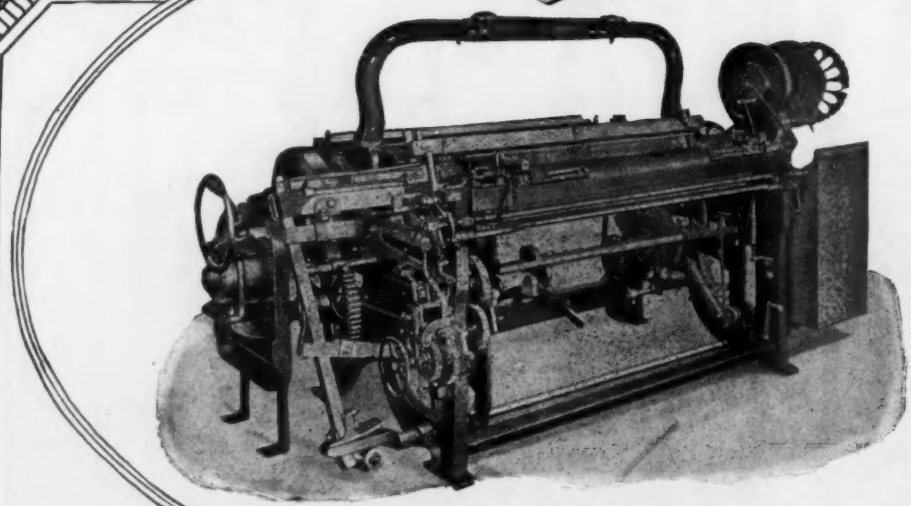
The highest type of steel craftsmanship, both in design and workmanship, are represented in this type of Truscon Steel Window. There are many types of Truscon Windows that meet practically every need of the architects and engineers, from the plain factory building to the monumental power house.

Truscon Steel Company

Youngstown Ohio

Sales and Engineering Offices in Principal Cities

TRUSCON STEEL WINDOWS



Stafford bobbin-changing plain goods loom.

Stafford Looms Increase Production

We manufacture a complete line of automatic looms, both shuttle and bobbin-changing for weaving practically every type of fabric that can be made with a single shuttle. ¶ Stafford shuttle-changing looms will handle cop filling just as successfully as bobbin filling. We have a loom for every kind of yarn, coarse or fine, and for practically every variety of fabric, plain or fancy.

THE STAFFORD COMPANY

WEAVING MACHINERY

READVILLE, MASS.

Branch Office
502 Colt Building
Paterson, N. J.

Southern Agent
J. H. Mayes
Charlotte, N. C.

Canadian Representative
Whitehead, Emmans, Limited
Montreal

AUTOMATIC

STAFFORD

LOOMS

SACO-LOWELL

Largest Manufacturers of Textile Machinery in America

COTTON, SILK, JUTE, AND WORSTED MACHINERY

FLYERS, RINGS, SPINDLES AND FLUTED ROLLS

Your inquiries solicited.

SACO-LOWELL SHOPS

Executive Offices

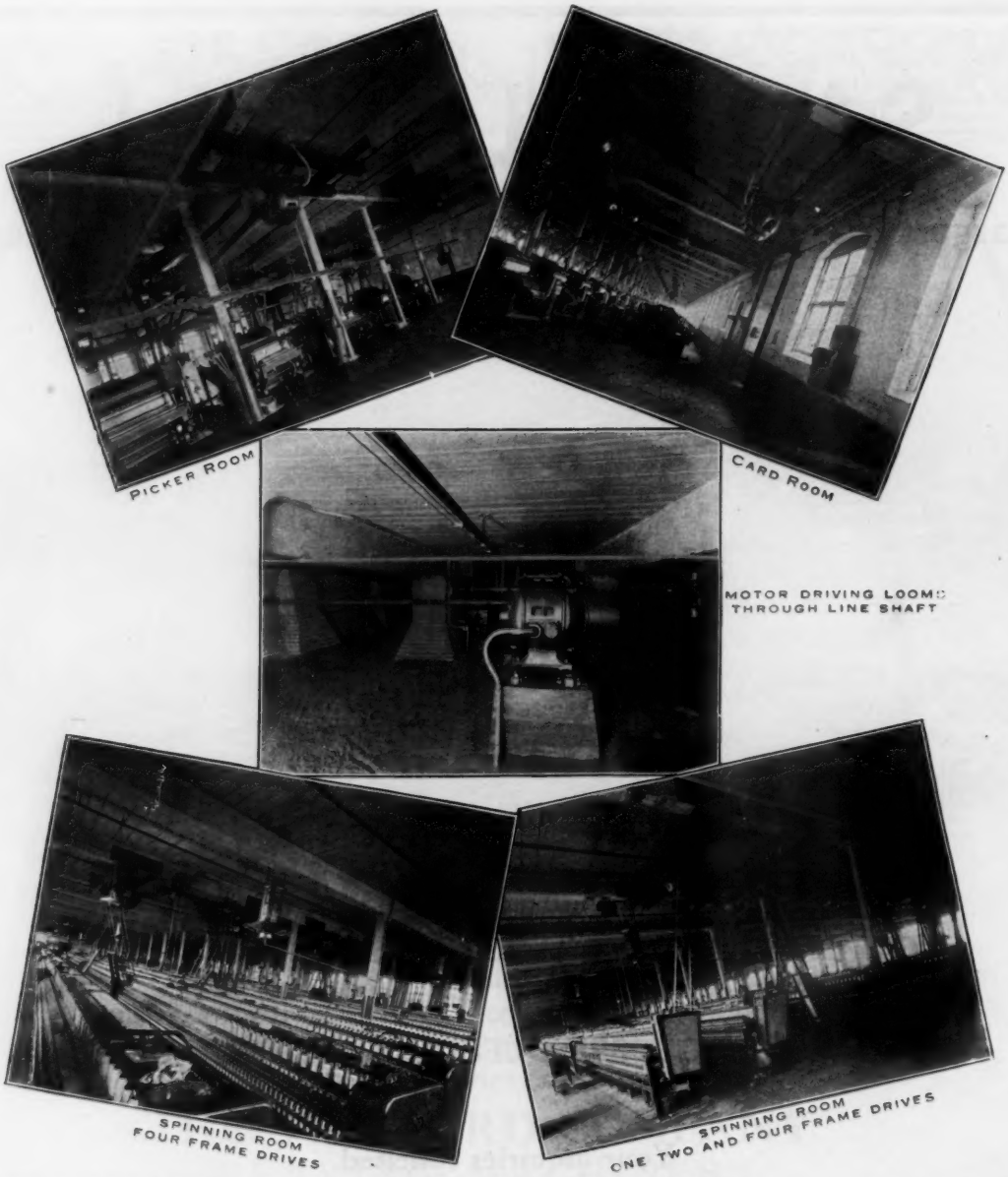
77 Franklin St.

Boston, Mass., U. S. A.

Southern Agent
Rogers W. Davis
Charlotte, N. C.

Branch Southern Office
Greenville, S. C.

PLANTS
LOWELL, MASS.
BIDDEFORD, MAINE
PAWTUCKET, R. I.
NEWTON UPPER FALLS, MASS.


PICKER ROOM
CARD ROOM
MOTOR DRIVING LOOMS THROUGH LINE SHAFT
SPINNING ROOM FOUR FRAME DRIVES
SPINNING ROOM ONE TWO AND FOUR FRAME DRIVES

ALLIS-CHALMERS Textile Motor Installation, Henderson Cotton Mills
An Unsolicited Testimonial

Allis-Chalmers Mfg. Co.,
Milwaukee, Wis.

Henderson, Ky., Oct. 3, 1922.

Dear Sirs:

I wish to say that I have had in my charge for the past two years 107 of your motors (Induction Type) ranging from 5 H.P. to 75 H.P. and have not had any trouble, not even a hot bearing. I want to say they are the best motors I ever saw. My experience heretofore has been with other makes of motors.

Yours very truly,
T. C. Witherspoon,
1219 Helm St.

ALLIS-CHALMERS PRODUCTS
Electrical Machinery
Steam Turbines
Steam Engines
Gas and Oil Engines
Hydraulic Turbines
Crushing and Cement Machinery
Mining Machinery

ALLIS-CHALMERS MANUFACTURING COMPANY

MILWAUKEE, WISCONSIN, U.S.A.

ALLIS-CHALMERS PRODUCTS
Flour and Saw Mill Machinery
Power Transmission Machinery
Pumping Engines-Centrifugal Pumps
Steam and Electric Hoists
Air Compressors - Air Brakes
Agricultural Machinery
Condensers

Good lighting would avoid eighteen percent of industrial accidents

THIS percentage is quoted from Safety Statistics. Prevention of accidents which are attributed to carelessness or ignorance involves a change of long established habits. No such obstacle stands in the way of avoiding accidents due to faulty lighting. Furthermore, the cost is very small compared to the return in better products and increased out-put.

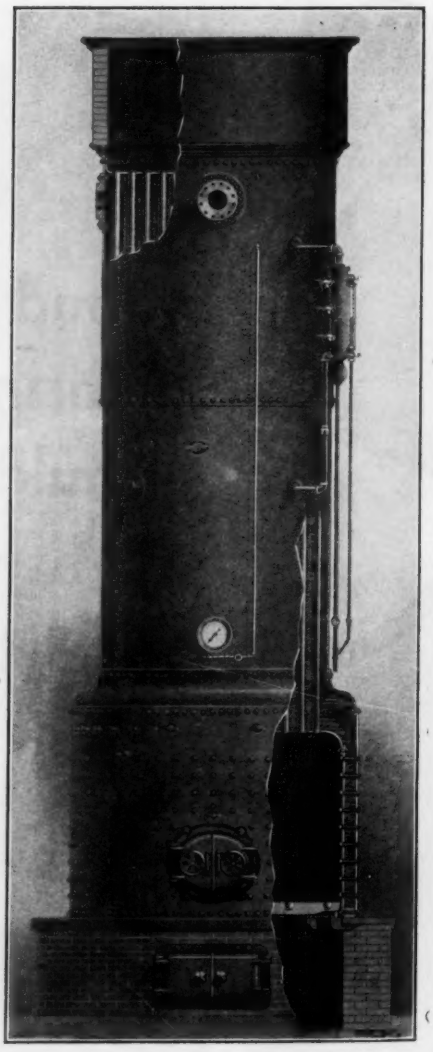
"YES, but where do I come in?" Such is your probable query. To see just where you come in on this proposition, have one of the Westinghouse Industrial Lighting Specialists survey lighting conditions in your factory. Often advisable changes require only a rearrangement of equipment already in use.

AT any rate, ask a Westinghouse dealer, or write to the address below for this specialized, but free service.

Westinghouse-Cutter reflector of Standard RLM Dome type as used with Westinghouse Mazda Lamps. Note the effective well directed light in the above installation at the Hall-Scott Motor Co., Berkeley, California.

Westinghouse Electric & Manufacturing Company
George Cutter Works **South Bend, Indiana**

Westinghouse



Manning Type Vertical Boiler
Adapted for Mill Work

INTERNATIONAL ENGINEERING WORKS, Inc.
FRAMINGHAM, MASS.

Southern Representative,
Isaac Hardeman, Charlotte, N. C.

BOSTON
PHILADELPHIA

NEW YORK
SAN FRANCISCO

"Clip" Gate Valves

Fig. 600. Screw Ends, Iron Body Bronze Mounted.

A original Lunkenheimer development with a record of more than twenty years of success in service.

The simplicity of the design; the durability and the wide range of sizes and material combinations available peculiarly fits them for standardization in the low pressure lines throughout the plant. The Inside Screw type is recommended for pressure up to 100 pounds, while the Quick-operating type is good for 50 pounds.

Iron Body Bronze Mounted for handling Steam, Water, Oil, etc., and "All-Iron" for use with Acids, Alkalis and other fluids which attack bronze alloys.

Specify LUNKENHEIMER and insist on getting the genuine. Booklet 505-AK covers the full range of types and sizes, together with descriptions and list prices. Let us send you a copy.

THE LUNKENHEIMER CO.

"QUALITY"

LARGEST MANUFACTURERS OF HIGH GRADE ENGINEERING SPECIALTIES IN THE WORLD

NEW YORK CHICAGO CINCINNATI, U.S.A. BOSTON LONDON

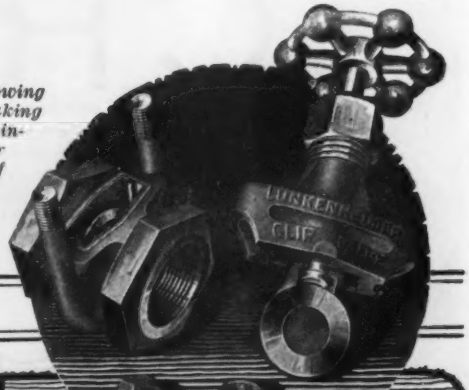
EXPORT DEPT. 129-135 LAFAYETTE ST., NEW YORK

5-18-10

Fig. 630. Quick-operating type, Screw Ends. I.B.B.M.

Fig. 638. Flange Ends, Iron Body, Bronze Mounted.

View showing ease of taking apart for inspection or cleaning of internal parts.

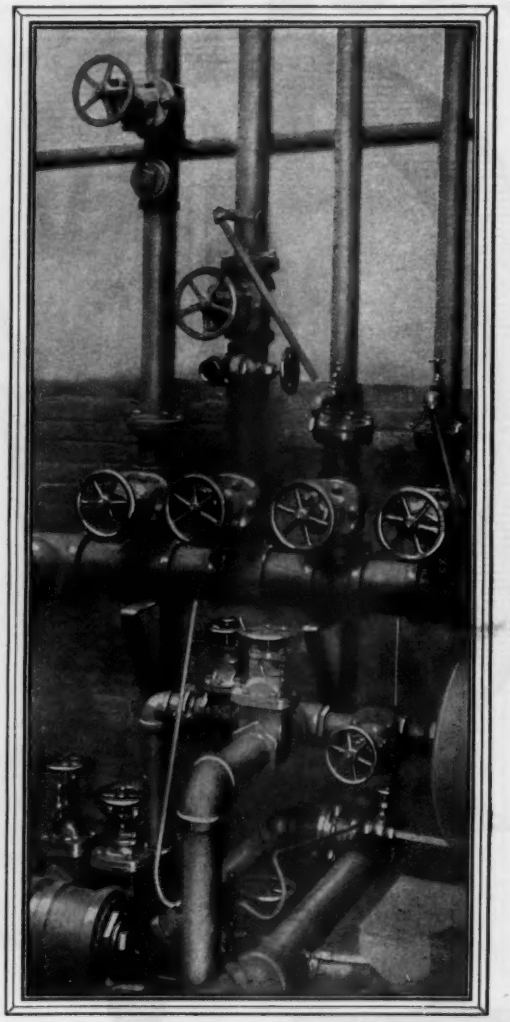


"America's Best since 1862"

LUNKENHEIMER

Rebuilding for Greater Production

When you remodel your plant to increase its capacity or improve its efficiency, your investment can be made to yield greater dividends if you rebuild with dependable equipment. For the pipe-lines, Crane valves, fittings and steam specialties satisfy the most exacting requirements of safety and endurance. Crane equipment is supplied to meet every need for the piping of steam, water, ammonia, gas, air and oil.



The illustration at the right shows Crane ferrosteel valves and fittings used in rebuilding the Chicago plant of Roberts & Oakes, packers

CRANE

GENERAL OFFICES: CRANE BUILDING, 836 S. MICHIGAN AVE., CHICAGO
Branches and Sales Offices in One Hundred and Thirty-five Cities
National Exhibit Rooms: Chicago, New York, Atlantic City
Works: Chicago and Bridgeport

CRANE, LIMITED, MONTREAL. CRANE-BENNETT, LTD., LONDON
CRANE EXPORT CORPORATION: NEW YORK, SAN FRANCISCO
CIE CRANE, PARIS

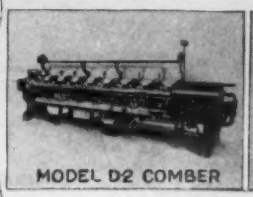
Crane "Telsa" Wash Sink Faucet

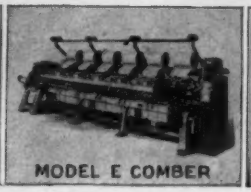
WHITIN MACHINE WORKS

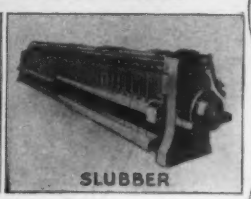
ESTABLISHED 1831

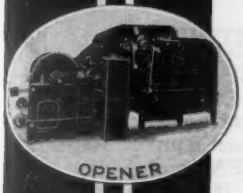
TEXTILE MACHINERY

MAIN OFFICE AND WORKS, WHITINSVILLE, MASS., U.S.A.









Manufacturers of

COMPLETE EQUIPMENTS

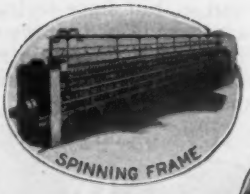
for Making

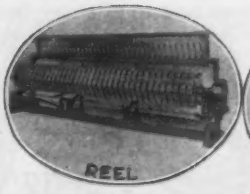
YARNS

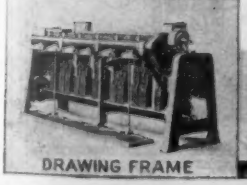
from

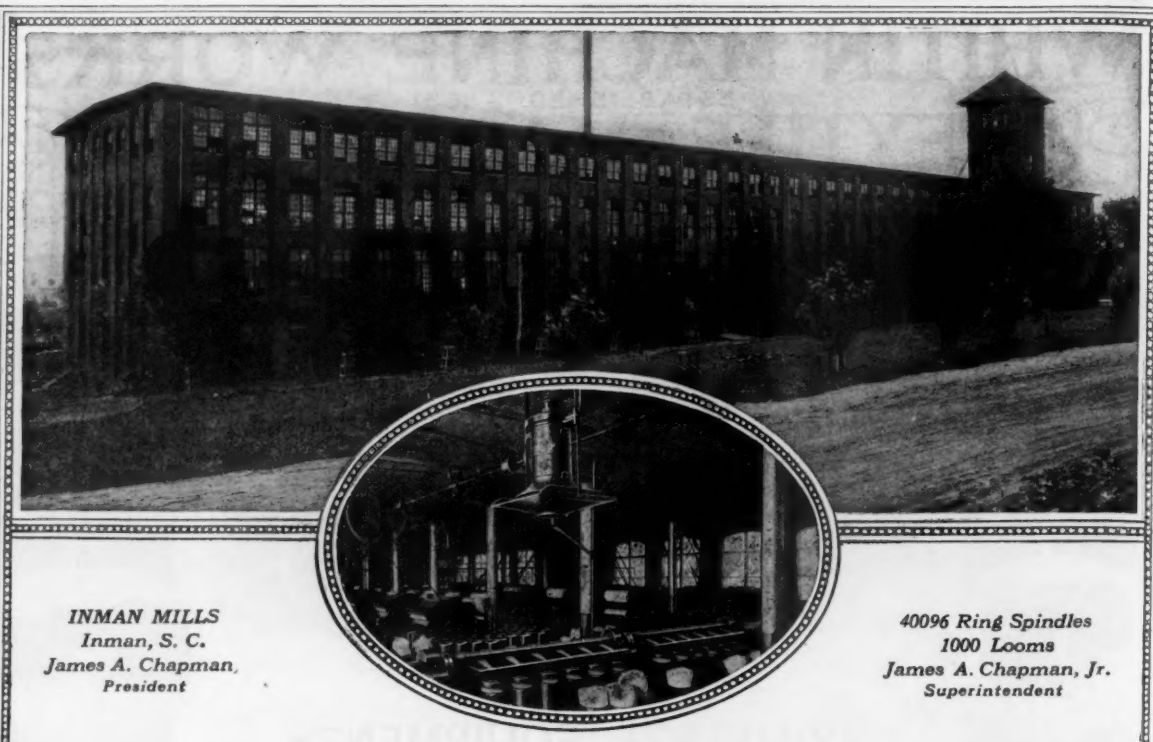
COTTON, COTTON WASTE, WOOL, ASBESTOS, ETC.

Descriptive Circulars on Request









INMAN MILLS
Inman, S. C.
James A. Chapman,
President

40096 Ring Spindles
1000 Looms
James A. Chapman, Jr.
Superintendent

Inman Mills. Remodel Humidifying Equipment

Speed up Front Rolls on Warp Frames 6 per cent.

"A few days ago we were checking results that we got from putting in your High Duty Heads in our Carding and Spinning rooms. We found that we got much better running work, more even yarn. We also have found that we do not have to change our filling draft gears on our spinning but about once every three months, while we used to have to change them about twice a month.

We almost never have to change our draft gears on our warp.

We think the thing that tells the story the best is the fact that while we formerly got 102 RPM on our front rolls on our warp frames, we are now getting 108 RPM. We have taken out several teeth of twist on this warp and have never had to put any back in.

On our filling we formerly got about 93 RPM while all during the past summer we got from 103 to 105 RPM, and would in fact still be getting it if we had'nt gotton in some cotton which was too short for us to spin without putting in some more twist.

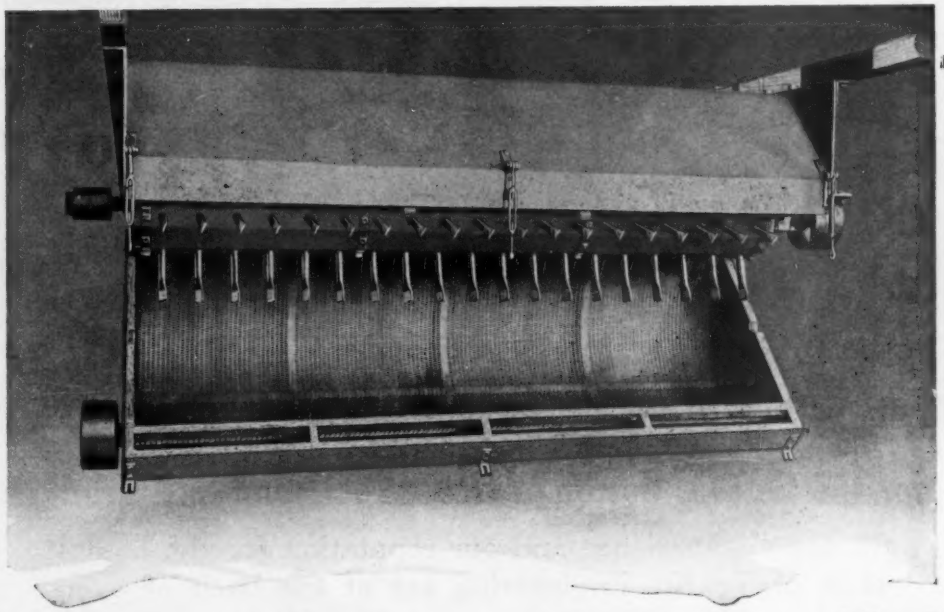
As you know before you put in this system we had what we thought were humidifiers, which were really about the best that could be bought when they were put in, but since trying out yours we have found out that we didn't have humidifiers. In fact I do not see how we were able to get along as well as we did under the old system."

Very truly yours,

Jas. A. Chapman Jr.
Supt.

Parks-Cramer Company
Engineers & Contractors
Industrial Piping and Air Conditioning
Fitchburg Boston Charlotte

COTTON WELL OPENED IS HALF SPUN



"We Cannot Recommend It Too Highly"

AMERICAN TEXTILE CO.

That the Murray Cotton Cleaning and Aerating Machine is fulfilling a long-felt need is best attested to by letters from users. Read the letter from Mr. Miller of the American Textile Co.

Mr. N. B. Henry, Ch. Eng.,
The Murray Company, Atlanta, Ga.

Gentlemen:—

We have now been using one of your cotton openers for approximately eight weeks. We have watched its operation carefully and do not hesitate to say that it does more and better work than any other opening device with which we have had any experience. As a supplementary cleaning and opening machine to be used in connection with other standard opening devices it fills a long-felt want. It will be a pleasure to us to show anyone interested in the machine how it operates in our mill at this place. We cannot recommend it too highly.

Yours very truly,
THE AMERICAN TEXTILE CO.
(Signed) J. A. Miller, President.

The Murray Cotton Cleaning and Aerating Machine thoroughly cleans and aerates the cotton without injuring the fibre. It can be set into the cotton suction pipe between opening room and breaker pickers and hung from the ceiling or other convenient support. No expensive connecting arrangements necessary.

Opening machinery can be speeded up or slowed down to meet requirements of breaker pickers without altering speed of the cleaner. The Murray takes care of itself. It has a working capacity of 25,000 lbs. of cotton in a ten-hour day—more than any other cleaning machine on the market.

Cylinder runs in ball bearings. Every bearing on the Murray is in plain sight.

Ask for full information today.

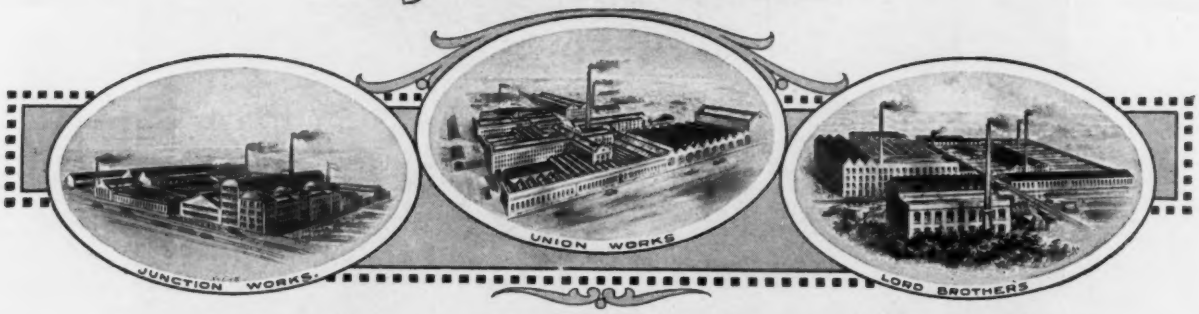
THE MURRAY COMPANY
ATLANTA, GA.

The Murray (PAT. PENDING)

COTTON CLEANING AND AERATING MACHINE

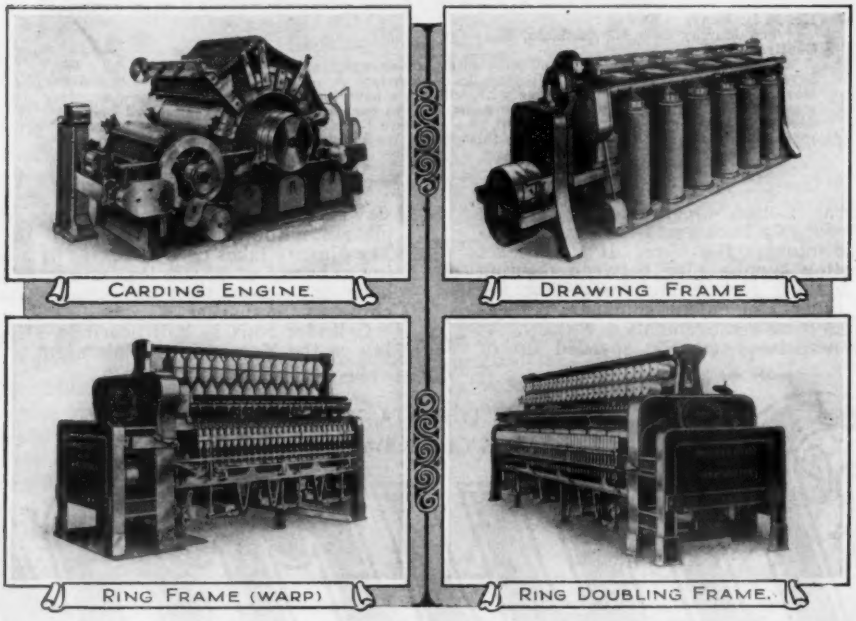
COTTON WELL OPENED IS HALF SPUN

BROOKS & DOXEY
(1920) LIMITED



TEXTILE MACHINERY MAKERS
for the Cotton, Cotton Waste, Wool, and Silk Trades

60 years' experience and our reputation for the highest class of Textile Engineering are at the back of every machine we build. Some of the finest and most efficient mills in the world have been equipped by us.



Address Letters: P. O. Box 34, Manchester. Codes: A B C 5th Ed., Lieber's, Bentley's, A1 and Western Union (Universal) Telegrams: "UNION, MANCHESTER."

HEAD OFFICE:- UNION IRON WORKS, WEST GORTON, MANCHESTER, ENG.

INCORPORATING LORD BROS. TODMORDEN.

ALABAMA'S PIEDMONT SECTION

Acroplane view of 120,000 h.p. hydro-electric development of Alabama Power Company, now under construction at Mitchell Dam on the Coosa River, located 14 miles down stream from Lock 12.

The Piedmont section of Alabama embraces a territory of approximately 25,000 square miles in area. This great expanse of territory among the foothills of the Appalachian Mountains is inhabited by a race of pure Anglo-Saxons.

The rural population of this section in 1920 was 1,100,000 against a rural population of 1,050,000 in 1910, an increase of 50,000 in the rural population. The urban population of 471,000 is approximately 30 per cent of the total population of this section which is 1,571,000.

An invigorating climate throughout this territory is one of the great and attractive advantages in inducing the man who labors to remain within its borders. An average temperature for the year of 60 to 70 degrees, with practically no extremes, makes for an ideal working climate. Elevations vary from 800 feet to 1500 feet above sea level.

Raw materials in abundance are found in close proximity to mills. Cotton production for this section and immediately adjoining territory will approximate 1,000,000 bales for the year 1922. 1,285,000 spindles and 22,000 looms located in 38 cities and towns throughout this territory consume only a small per cent of the total available supply.

Ten large railroad systems give Alabama manufactured products trunk line shipping facilities to all markets of the country, as well as shipping connections to all foreign markets.

The river system of Alabama perhaps has no equal in America from the standpoint of continuous supply of water for manufacturing purposes.

ALABAMA IS TRULY THE LOGICAL LOCATION FOR THE FUTURE TEXTILE INDUSTRY. COME TO ALABAMA NOW AND PROSPER IN ITS DEVELOPMENT.

ALABAMA POWER CO.

BIRMINGHAM, ALA.

Tennessee

The Tennessee El

CHATTANOOGA

The Heart of Industrial America

The Logical Location for Your New Plant or a Branch Unit—

An industrial plant that is centrally located among the markets of the world and that can operate on low costs has a marked advantage over competition.

Tennessee offers industry peculiarly ideal advantages for the location of large or small plants. The strategists of the Army located the plants essential to the prosecution of the war away from the seaboard. They realized that the bulwark of the Appalachian Mountains afforded protection from invasion by the enemy. The security of its location gives Tennessee the peacetime advantage of future peace and prosperity.

Located in the heart of Industrial America it is central to all of our domestic markets. Its unique position, half-way between the Atlantic Ports and the Gulf, make the markets of Europe, South America and the vast area served by the Panama Canal equally accessible.

The raw materials are here—located in the heart of the cotton growing section, raw cotton is right at your back door. Other raw products, too numerous to mention, are here in abundance.

Climatic conditions and labor conditions are unequalled and the territory is amply supplied with continuous dependable electric power. Tennessee's hydro-electric developments are already extensive and more development is on the way.

Ask us today about sites and the many other advantages of Tennessee—the heart of industrial America—the logical location for your plant.

lectric Power Co.

TENNESSEE

THE FOSTER CONE

Model Thirty 6" Traverse Cone About 3/4 Regular Size

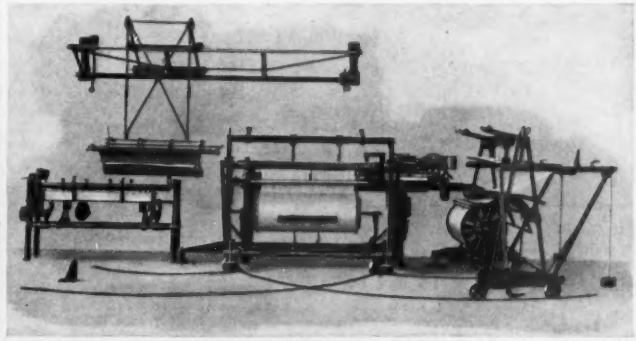
The Foster cone of knitting yarn is more than a package of yarn wound on a tapered cone base. The lay of each coil of yarn. The progressively increasing taper as the cone builds up in winding. The concave and convex ends each separately and all in combination insure to the user continuous running of the knitting machine and a knitted fabric of perfect even stitch.

FOSTER MACHINE COMPANY

WESTFIELD, MASS.

John Hill, Southern Representative, Healey Bldg., Atlanta, Ga.

B V C
TRADE MARK



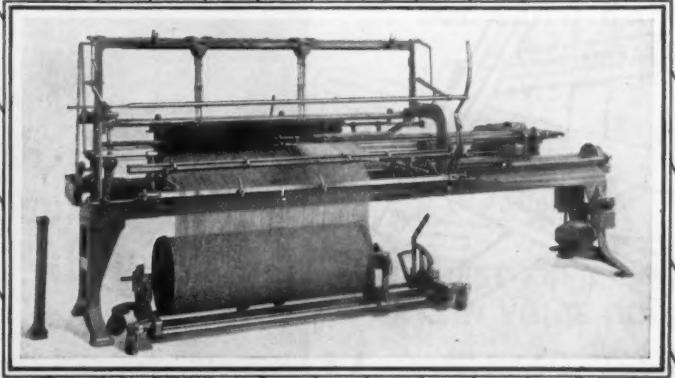
WARP TYING MACHINE MODEL E

THE MONEY YOU WILL SAVE BY USING THESE MACHINES WILL PAY FOR THEM IN A SHORT TIME

BARBER-COLMAN COMPANY
ROCKFORD, ILLINOIS

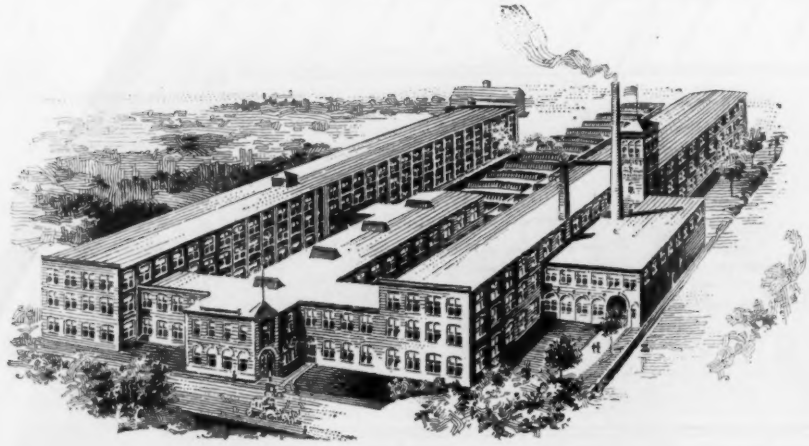
BOSTON, MASS. GREENVILLE, S. C.

B V C
TRADE MARK



WARP DRAWING MACHINE MODEL SS

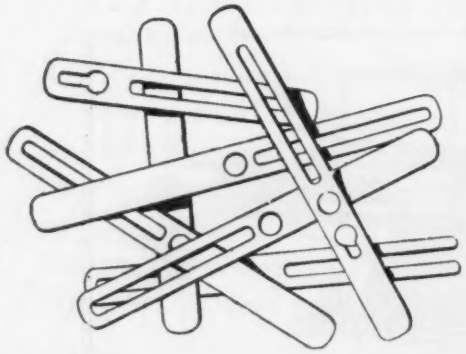
The Home of Greist Drop Wires



GREIST

SATIN FINISH

DROP WIRES



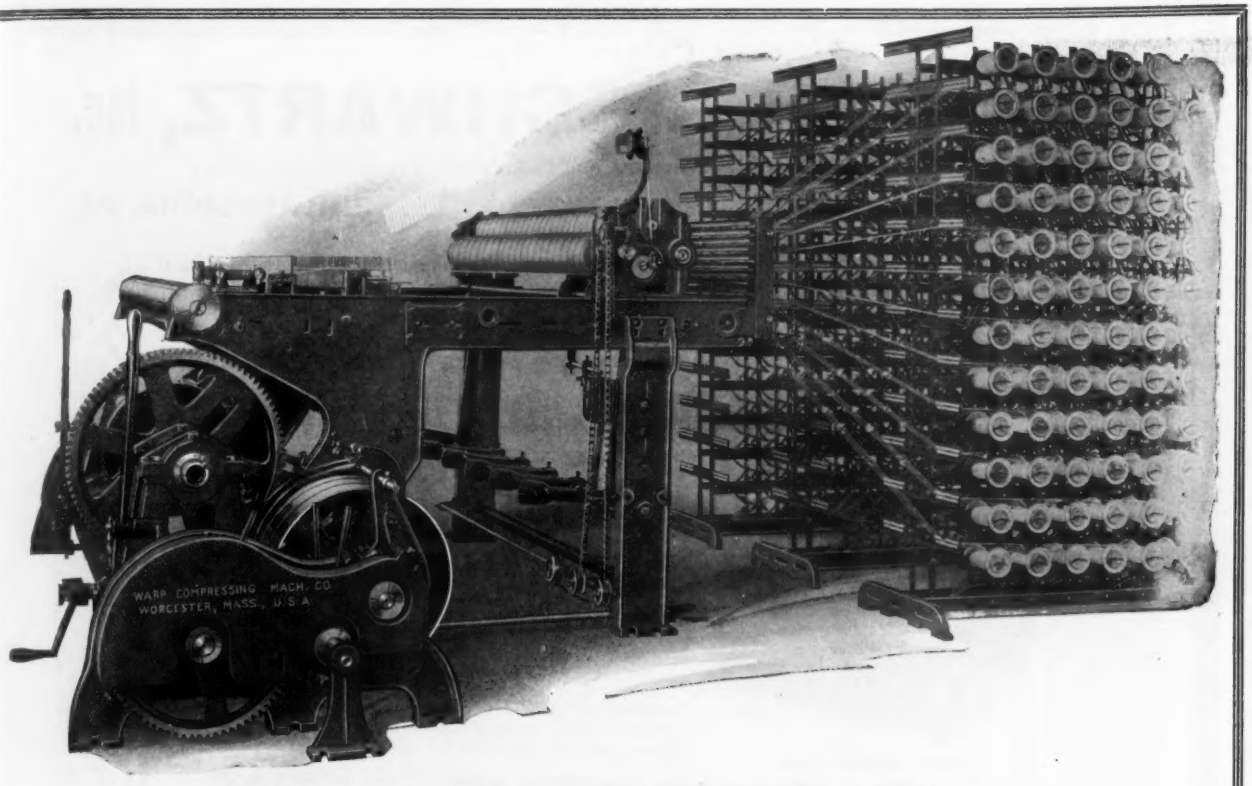
Uniformly made—free from burrs—a dependable source of supply.

The Greist Manufacturing Company

THE LARGEST MANUFACTURERS OF SEWING MACHINE ATTACHMENTS IN THE WORLD

Dept. C. *New Haven, Conn.*

Southern Representative
The G. G. Slaughter Machinery Co.
Greenville, S. C.



Direct Beaming Outfits

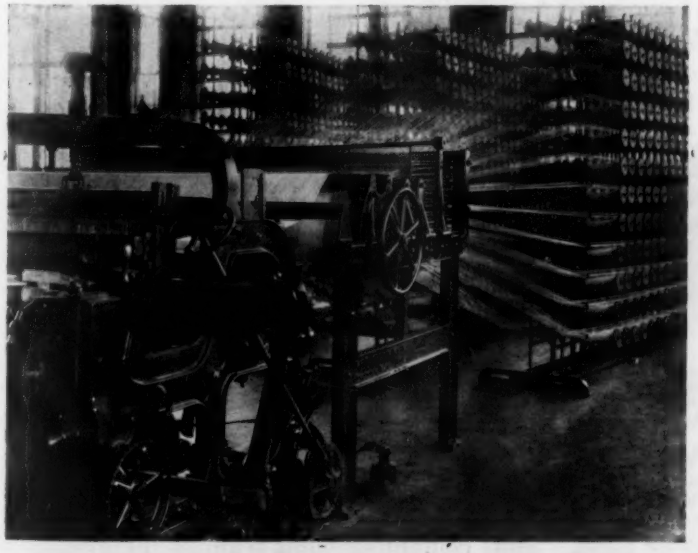
FOR PLIED YARNS

Built in Standard Heavy and Extra Heavy Weights

For:—AUTOMOBILE TIRE FABRICS: Cord and Duck Warps. DUCKS: SAIL-CLOTH: CAMEL'S HAIR PRESS CLOTH: WOVEN BELTING: STITCHED BELTING: CONVEYOR BELTING: ASBESTOS Brake-Band and Clutch Lining, etc.

Beaming directly from your twister spools or cheese packages. UNIFORM TENSIONS

30 to 50 per cent. more yarn per loom beam



Direct Weaving Outfits for Cord Fabrics

and SPECIALS

WARPER CREEL and TENSION DRESSER in connection with a cord fabric loom (we do not build loom)

HIGHEST EFFICIENCY TEST IN YOUR GOODS

Production Plus QUALITY

WARP COMPRESSING MACHINE CO.-:- Worcester, Mass. U. S. A.

Representative: F. W. KIESSLING, *Worcester, Mass.*

PROCTOR & SCHWARTZ, Inc.

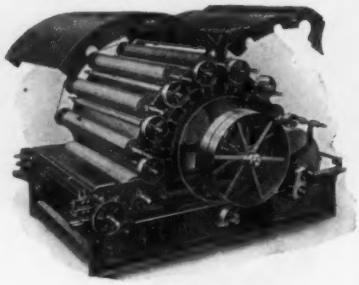
(Formerly Smith & Furbush Machine Co. and Philadelphia Textile Machinery Co.)

Seventh and Tabor Road, **PHILADELPHIA, PA.**

Specialists in machinery for various kinds of WASTES. Builders of Carding and Spinning Machinery for Wool, Asbestos, Cotton-waste and other yarns spun on the wool principle.

Garnetts and Shoddy Machinery. Batt or Felting Machinery, Machinery for wiping and car-box waste.

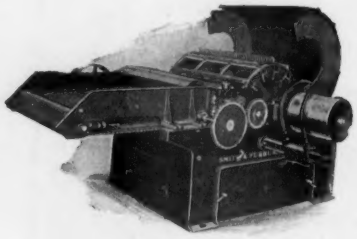
Complete equipments for Rewoven Gunny.



Cotton Waste Card

Ask for Circular S-165

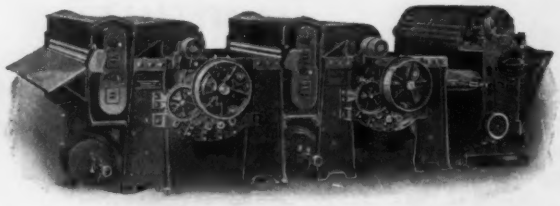
This is one of the carding units in a plant for making mop, cordage or other yarns from cotton waste.



Jute Picker

Ask for Circular S-166

This machine is used for opening Gunny and Burlap, forming a part of our equipment for the manufacture of Rewoven Gunny Bagging.

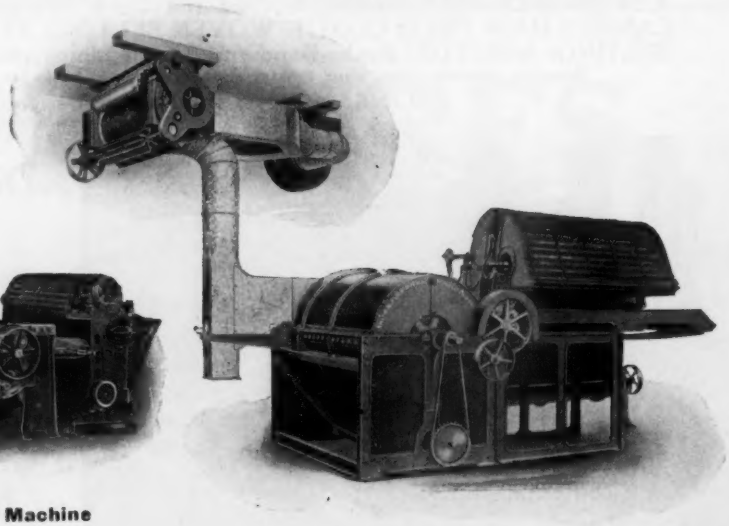


Cotton Waste Reclaiming Machine

(Shaughnessy Patent)

Ask for Circular S-90

The Shaughnessy Reclaimer does work not done by any other machine in recovering spinning fiber from low grade Cotton Wastes.



Continuous Outfit for Cotton Waste

Ask for Circular S-185

Our continuous outfit removes the loose dirt, dust and bits of iron, wood, etc., from low grade Cotton Waste.

WHAT IS THE GOOD WILL OF YOUR EMPLOYEES WORTH?

Good will has long been considered a vital business essential. Millions of dollars have been spent in gaining the good will of the public and customers.

But of late the good will, or ill will, of workers toward their jobs and their employers has been recognized as of paramount importance.

Bankers when considering the soundness, the prospects, and the credit of any concern needing funds now carefully appraise the relationship between the Management and employees.

Have you ever stopped to figure what the good will of your workers is worth, what it means in extra production, better quality and reduced waste? Ordinarily 25% of the payroll is a conservative margin.

Do you realize that between a negative and constructive mental attitude of labor there is a difference of approximately $50,000 in actual productive value for every two hundred thousand dollars of wage?

The establishing of good will among one's employees is no longer a theoretical value or a bit of sentiment. It is good sound business.

There is only one BEST method by which this good will can be created and maintained. We are prepared to prove this to you.

"The Worker's viewpoint is the Most neglected Factor in Industry"

SHERMAN SERVICE, INC.

Industrial Co-ordination—Production Engineering

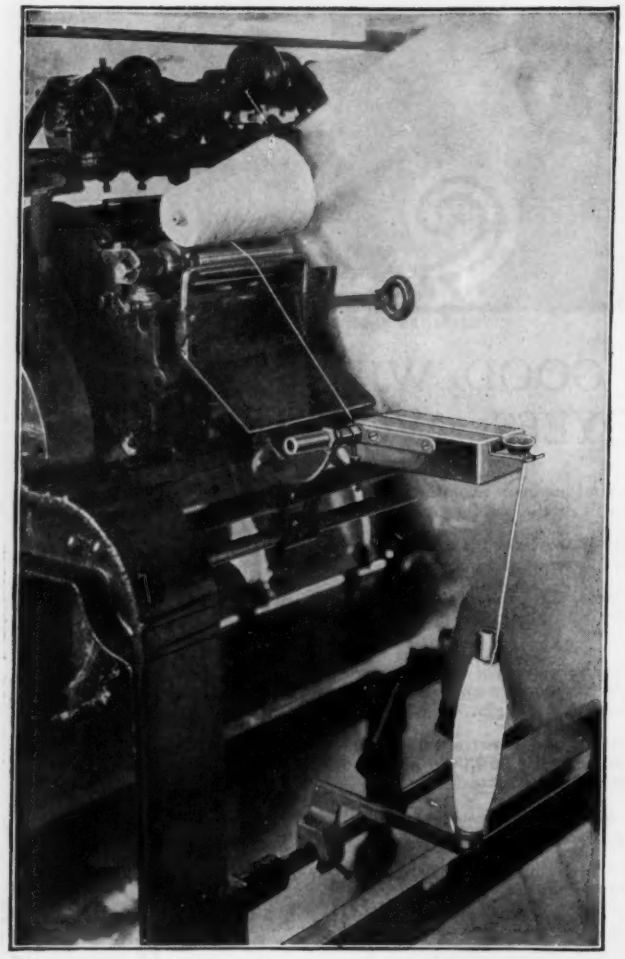
New York 2 Rector St. | Chicago 208 So. LaSalle St. | Philadelphia 1011 Chestnut St. | Boston 10 State St. | St. Louis 314 No. Broadway

Cleveland Park Building | Detroit 333 State St. | New Haven 42 Church St. | Toronto 10 Adelaide St. East

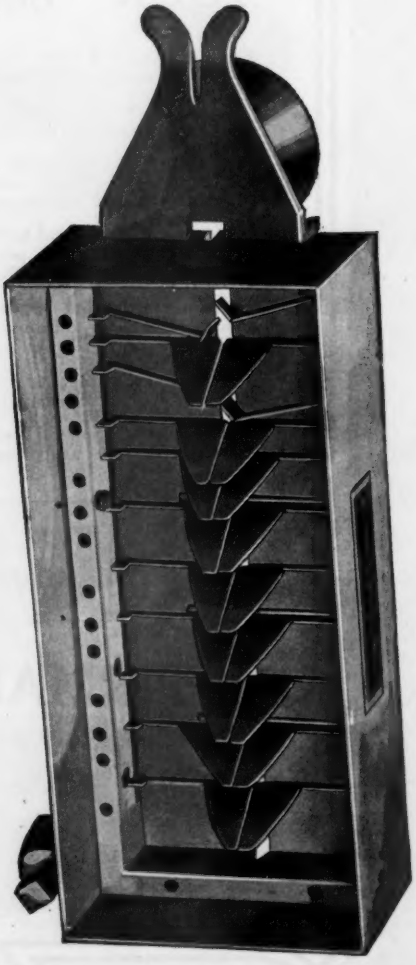
Pittsburgh 401 Wood St. | Kansas City Reliance Building | Montreal Drummond Building

Largest organization of its kind in the world

SHERMAN SERVICE



The
ECLIPSE
Automatic Yarn Cleaner



AN entirely new principle is involved in that the yarn is cleaned by **flexible** blades which vibrate **constantly.** This device is small and compact and easily attached. The strength and elasticity of the yarn is not affected in the slightest.

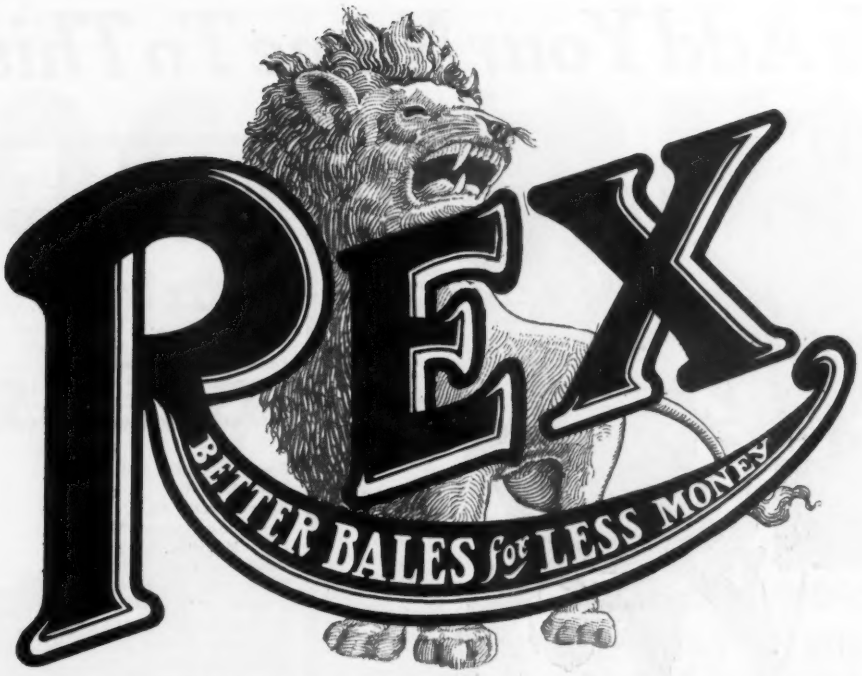
When writing, state make of spooler or winder.

ECLIPSE TEXTILE DEVICES, INC.

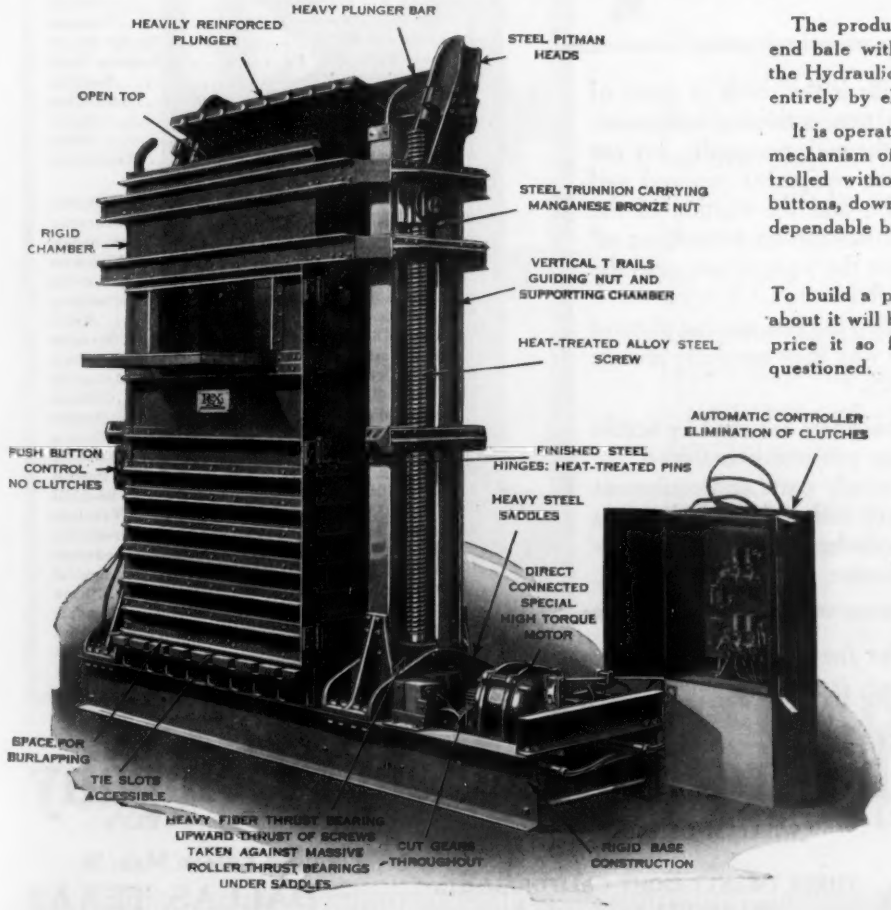
Makers of

Automatic Yarn Cleaners Automatic Stop Motions Yarn Tension Devices

ELMIRA, N. Y.



Engineers and Practical Mill Men at the Greenville Exposition Acclaim "REX" the King of Balers


HEAVY PLUNGER BAR
HEAVILY REINFORCED PLUNGER
STEEL PITMAN HEADS
OPEN TOP
STEEL TRUNNION CARRYING MANGANESE BRONZE NUT
RIGID CHAMBER
VERTICAL T RAILS GUIDING NUT AND SUPPORTING CHAMBER
HEAT-TREATED ALLOY STEEL SCREW
REX
AUTOMATIC CONTROLLER ELIMINATION OF CLUTCHES
PUSH BUTTON CONTROL NO CLUTCHES
FINISHED STEEL HINGES: HEAT-TREATED PINS
HEAVY STEEL SADDLES
DIRECT CONNECTED SPECIAL HIGH TORQUE MOTOR
SPACE FOR BURLAPPING
TIE SLOTS ACCESSIBLE
HEAVY FIBER THRUST BEARING UPWARD THRUST OF SCREW TAKEN AGAINST MASSIVE ROLLER THRUST BEARINGS UNDER SADDLES
CUT GEARS THROUGHOUT
RIGID BASE CONSTRUCTION

The product of the "Rex" is a small square end bale with all the compact qualifications of the Hydraulic Press, yet the "Rex" is controlled entirely by electricity.

It is operated by a powerful double screw type mechanism of unique design and electrically controlled without clutches by three simple push buttons, down—up—stop. The fastest and most dependable baler on the market.

The Rex Creed

To build a press so good that the simple truth about it will be adequate recommendation and to price it so fairly that its value can never be questioned.

We unreservedly guarantee 100% satisfaction. Descriptive literature on request.

REX ENGINEERING CORPORATION

DUNKIRK, N. Y.

J. S. HULME

Southern Representative:
Atlanta Trust Co. Bldg.

ATLANTA, GA.

Let Us Add Your Name To This List

OUR service to textile mills is the result of years of experience in installing textile theatre equipment. Our representatives call upon the mills personally, lay out the plans, advise on the proper equipment required and finally supervise the installation and the starting of the theatre. In other words, they take the whole problem off your hands and do not turn over the work to you until the theatre is operating satisfactorily.

The textile industry is demanding the best moving pictures for their employees and that is why they regularly specify POWER'S PROJECTORS.

That is why more Power's Projectors are used by textile mills in the South than all other projectors combined.

We carry a complete line of supply parts and equipment at our various branches. Your orders for supply parts will be filled the same day the order is received. Whatever are your needs for your theatre, we can supply them.

We have a special offer for Textile Mills. May we present it to you?

Satisfied Users of POWER'S PROJECTORS

ALABAMA

W. A. Handley Mfg. Co.	Roanoke
Tallassee Mills	Tallassee
Fairfax Mill	Fairfax
Avon Mills	Sylacauga
Lanett Cotton Mills	Lanett
Indian Head Mills	Cordova
Selma Mfg. Co.	Selma
Buck Creek Cotton Mills	Siluria

GEORGIA

Elm City Cotton Mills	LaGrange
Bibb Mfg. Co.	Porterdale
Roswell Mfg. Co.	Roswell
Gainesville Cotton Mill	Gainesville
Bibb Mfg. Co.	Columbus
Pacolet Mfg. Co.	New Holland
Manchester Cotton Mills	Manchester
Milstead Mfg. Co.	Milstead
Thomaston Cotton Mills	Thomaston
Exposition Cotton Mill	Atlanta
Habersham Mill	Habersham
Trion Company	Trion
Union Point Mfg. Co.	Union Point
Hillside Cotton Mill	LaGrange

NORTH CAROLINA

Durham Hosiery Mills	Durham
Pamona Mills	Greensboro
Cleveland Mill & Power Co.	Lawndale
Rodman-Heath Cotton Mills	Waxhaw
Rocky Mount Mills	Rocky Mount
Cherokee Falls Mfg. Co.	Cherokee Falls
Roxboro Cotton Mills	Roxboro
Consolidated Textile Corp.	Burlington
Carolina Cotton & Woolen Mills	Spray
Erwin Cotton Mills	Duke
Cannon Manufacturing Co.	Kannapolis

SOUTH CAROLINA

Baldwin Cotton Mills	Chester
Tucapau Mills	Tucapau
Ware Shoals Mfg. Co.	Ware Shoals
Glenn-Lowry Mfg. Co.	Whitmire
Monaghan Mills	Greenville
Drayton Mills	Spartanburg
Victor Mills	Greer
Conestee Mills	Conestee
Kershaw Cotton Mills	Kershaw
Abbeville Cotton Mills	Abbeville
Chesnee Mills	Chesnee
Union-Buffalo Mills	Buffalo
Victor-Monaghan Mills	Seneca
Victor-Monaghan Mills	Jonesville
Pacolet Mfg. Co.	Pacolet
Aragon Mills	Rockhill
Graniteville Mfg. Co.	Vancluse
Woodside Cotton Mills	Greenville
Orr Cotton Mills	Anderson
Issaqueena Mills	Central
Clifton Mfg. Co.	Clifton
D. E. Converse Co.	Glendale
Winnsboro Mills	Winnsboro
Monarch Mills	Lockhart
Republic Cotton Mills	Great Falls

Southern Theatre Equipment Company

WILLIAM OLDKNOW, President.

No. Nine Nassau St.
ATLANTA, GEORGIA

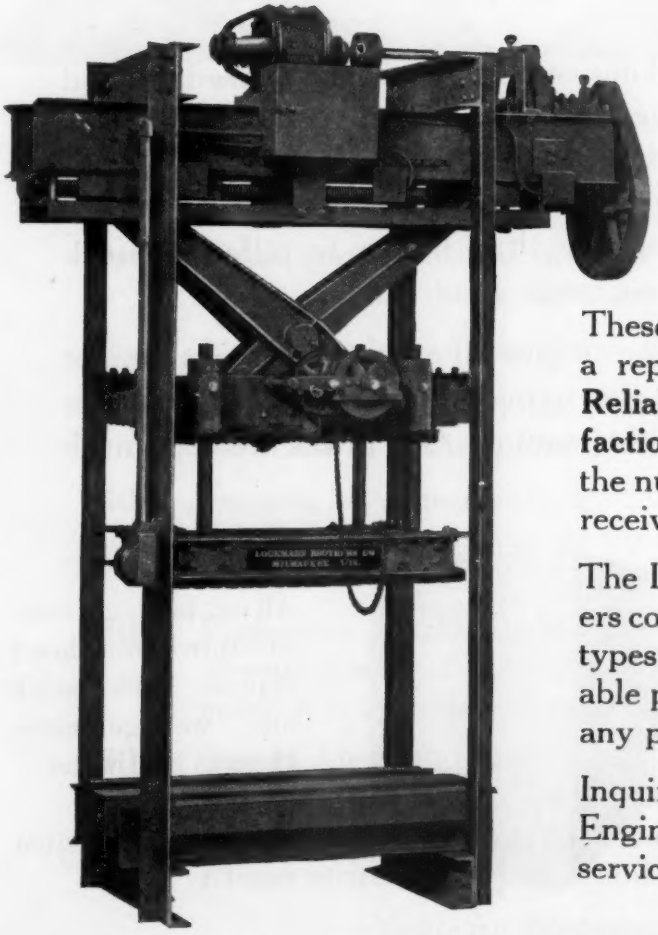
THREE TWENTY-EIGHT CALIFORNIA ST.,
OKLAHOMA CITY, OKLA.

Eighteen Fifteen Main St.
DALLAS, TEXAS

LOGEMANN

Hand-Belt-Electric-Hydraulic

Baling — Presses



USED FOR MANY YEARS IN HUNDREDS OF TEXTILE MILLS THROUGHOUT THE COUNTRY

These balers have established a reputation for **Economy, Reliability** and **General Satisfaction** that is best indicated by the numerous repeat-orders we receive continually.

The LOGEMANN line of balers consists of more than eighty types and capacities and a suitable press can be furnished for any purpose.

Inquiries are solicited and our Engineering Staff is at your service.

LOGEMANN BROTHERS CO.

Main Office & Works - Milwaukee, Wis.

Wooden Packing Cases

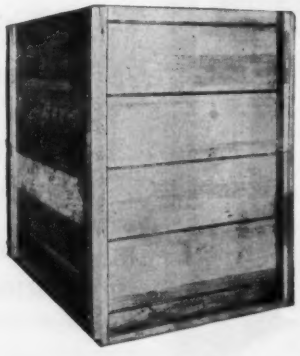
All Styles

Manufactured from
Georgia Pine
White Pine
Poplar
Cypress
and Gum

The interlocking packing case, shown in the upper left-hand corner, has advantages over other packages, especially for carrying heavy materials. In the first place, lighter weight material can be used in its construction on account of the interlocking reinforcement. It is harder to pilfer or break open than other packing cases.

We are now in position to give all orders for shooks prompt attention, and will be glad to quote prices and delivery dates on any cases you might require. Our prices are very much reduced, try us.

In addition to rectangular tanks, we manufacture a complete line of round tanks equipped with round iron hoops and malleable draw lugs.



All our tanks are manufactured from heart cypress tank stock and we guarantee them to hold water.

Your inquiry solicited.

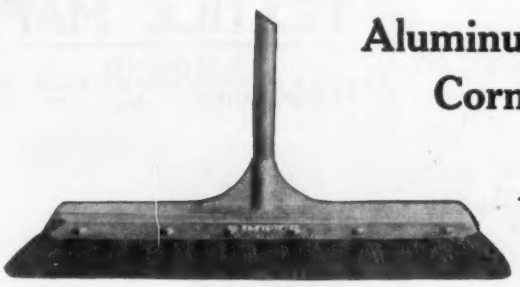
Hightower Box & Tank Co.

Corner Humphreys and Glenn Streets

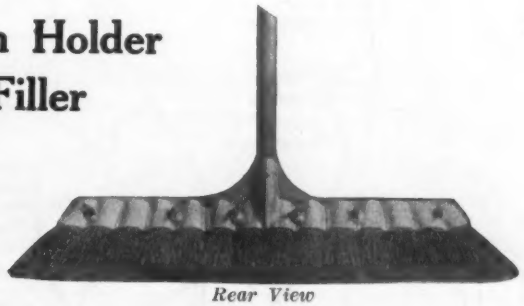
Atlanta, Ga. **Birmingham, Ala.**

Number 20
RE-FIL-IT TEXTILE SPECIAL

Aluminum Holder
Corn Filler



Front View



Rear View

Advantages of the Textile Special

1st. Loose corn from this brush is reduced to a minimum, making the waste more valuable.

2nd. It sweeps cleaner than the regular broom.

3rd. It is much faster than the old method of sweeping, particularly in the spinning room.

4th. Fanning is unnecessary by this method, and the liability of lint getting into the thread is reduced to the minimum.

5th. Preference for the Textile Special is shown by the sweepers when they realize how much faster and easier it is than the old method.

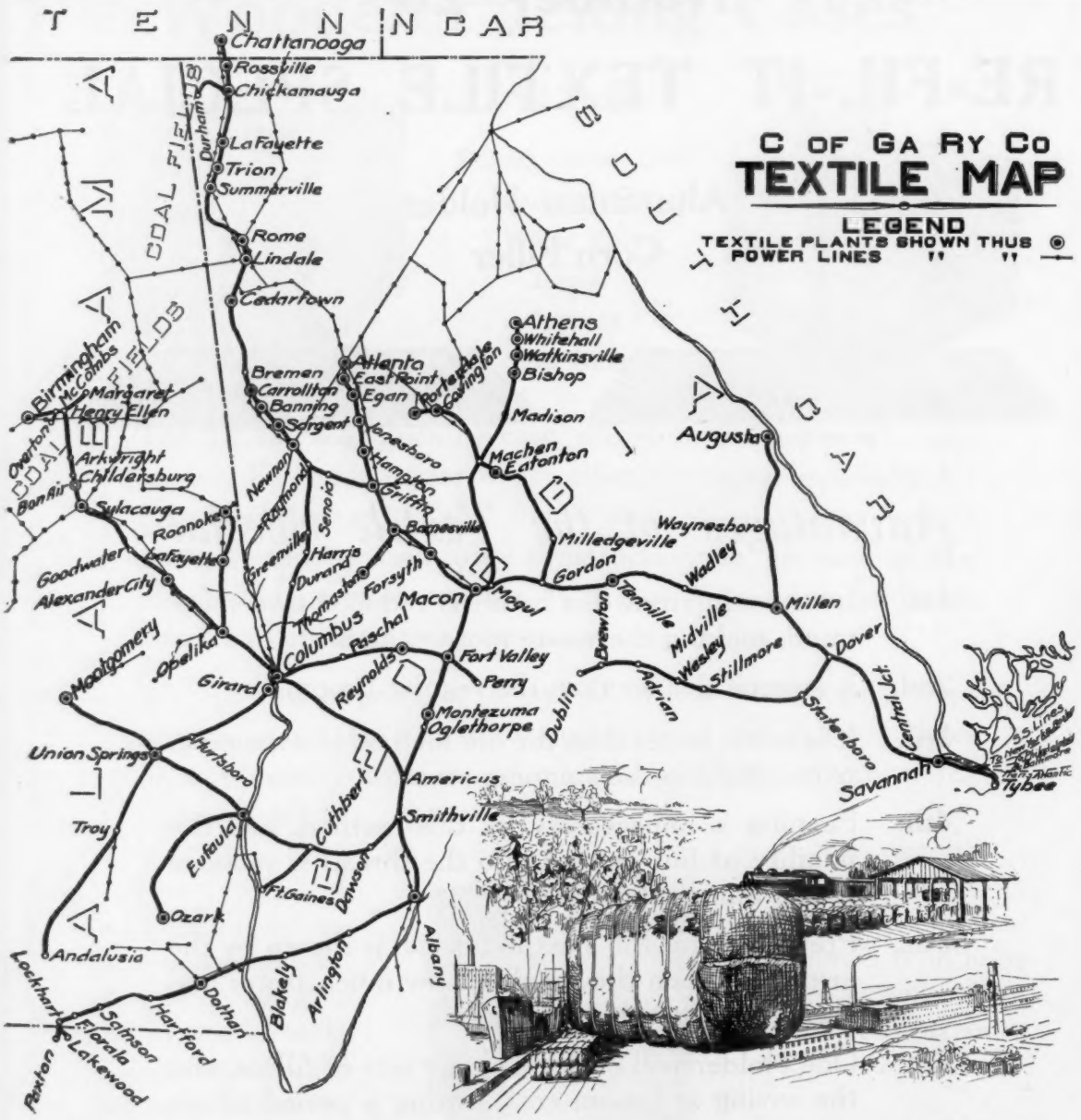
6th. One Holder will outwear many sets of fillers, and the saving in broom cost, during a period of six months or a year is very satisfactory.
Please write us for prices and full particulars.

Yours for Economy,

RE-FIL-IT BROOM MFG. COMPANY

185 Devonshire Street, Boston, Mass.

Logical Location for Textile Industries



Georgia has 201 textile plants, of which 115 or 57% are in cities served by the Central of Georgia.

Alabama has 74 textile plants, of which 27 or 36% are in cities served by the Central of Georgia.

The fact that these are successful, going concerns is convincing evidence that they are properly located.

This territory being supplied with hydro-electric power in ample quantity, and with nearby coal fields of Alabama and Tennessee, the question of power is fully solved.

While other essential requirements, such as labor, climate, adequate transportation and nearness to raw materials all combine to enable the Central of Georgia territory to offer those establishing new mills a location that is ideal and of proven value.

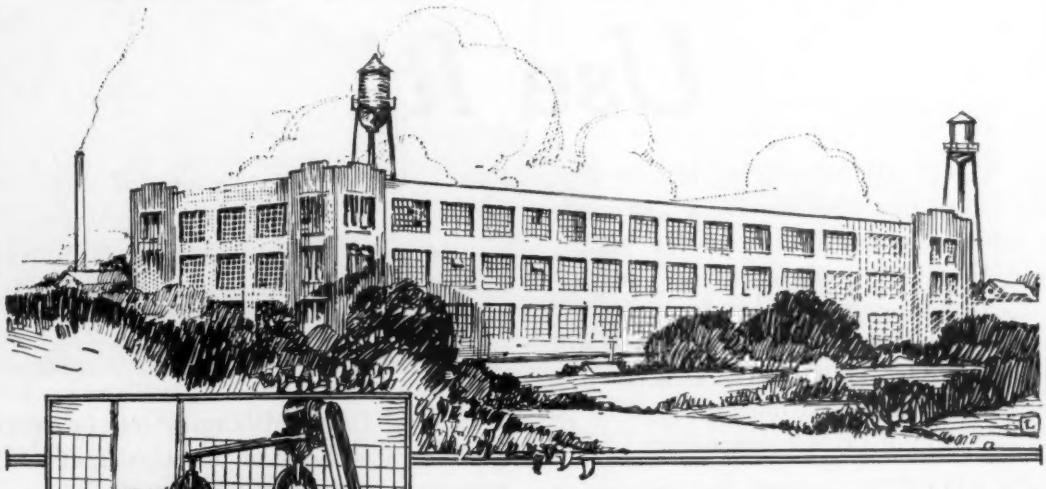
Further and detailed information will be gladly furnished upon request.

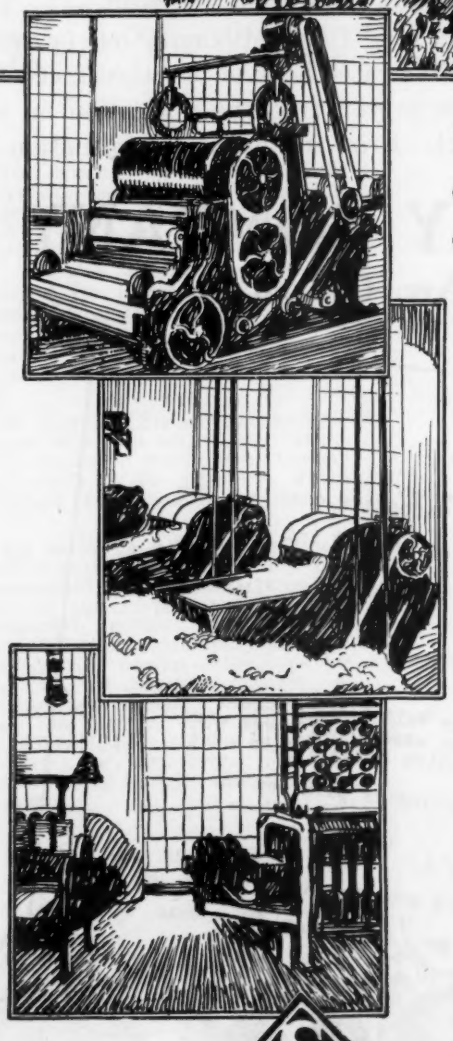
J. M. MALLORY, General Industrial Agent

CENTRAL OF GEORGIA RAILWAY

Savannah, Georgia

THE FUNCTIONS OF THE ENGINEER





The Engineer's recommendations can easily result in material savings without involving any great investment

IT IS part of the task of the Engineer to measure accurately.

"To measure is to economize." This assertion has been proved in countless cases by the Engineer. He has shown his client how to produce the same goods at a lower cost or more goods with the same money.

Called in by a manufacturer, perhaps, for the single purpose of making an appraisal or valuation of a factory, mill or other property, the Engineer has laid his yardstick of values, production and cost over the plant and discovered ways by which far-reaching economies could be obtained by the manufacturer.

These economies have eclipsed the Engineer's fee and have continued long after it has been forgotten.

J. E. SIRRINE & COMPANY
Engineers
Greenville South Carolina

SERVICE

Ask the Men who Use It!

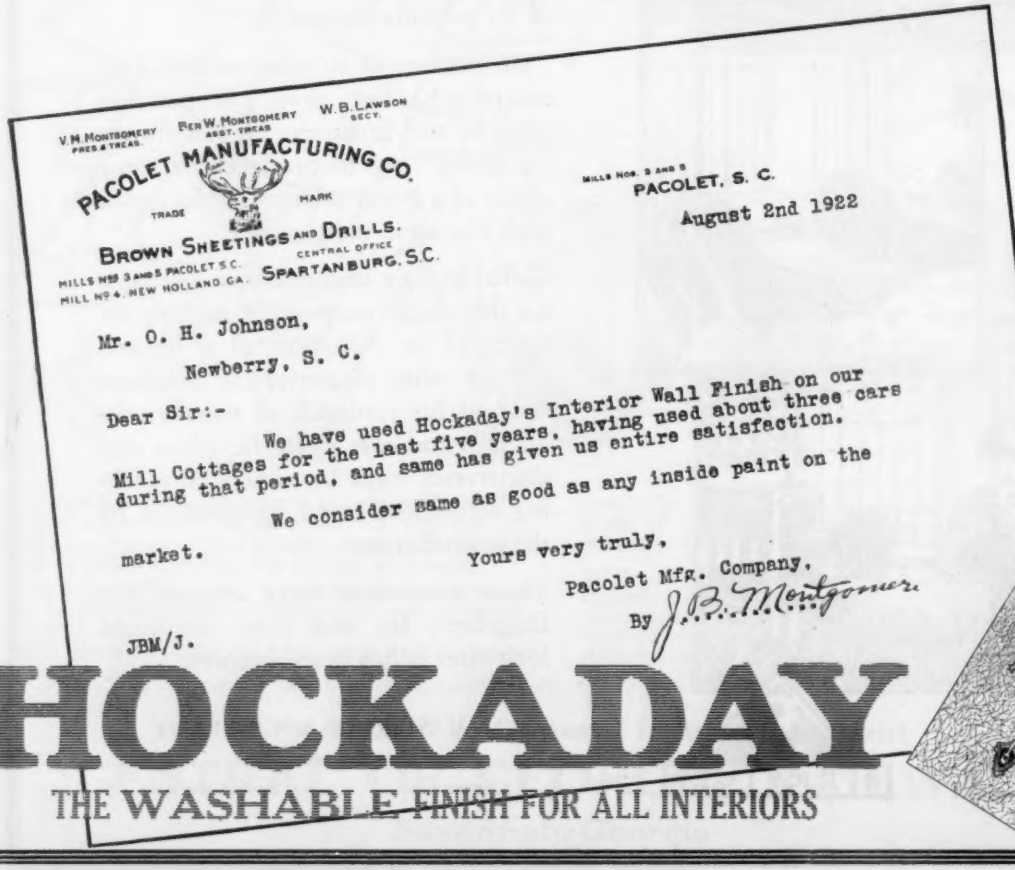
They know. Hundreds of letters from them tell us how HOCKADAY has coated the walls of their buildings for years—saved them hundreds of dollars because stains, dirt, finger prints, and grease could be removed from its surface by a simple washing. Also HOCKADAY saves hundreds more because it does away with the necessity of constant re-painting.

HOCKADAY is mixed by experts to cover a maximum amount of wall surface thoroughly for every gallon. Two coats do the work of three coats of inferior paints—the most efficient, most economical, most durable finish for walls that you can buy.

Are you interested in painting? Then send for "Paint Mileage," our beautifully illustrated book of practical facts. It's sent to you free—no obligation on your part. Brim full of vital information.

THE HOCKADAY COMPANY

1823-1829 Carroll Ave., Chicago



V. H. MONTGOMERY, PRES. & TREAS. — BEN W. MONTGOMERY, ASST. TREAS. — W. B. LAWSON, SECY.

PACOLET MANUFACTURING CO.

TRADE MARK

BROWN SHEETINGS AND DRILLS.

MILLS NOS. 3 AND 5 PACOLET S. C. MILL NO. 4. NEW HOLLAND GA.

CENTRAL OFFICE SPARTANBURG, S. C.

MILLS NOS. 3 AND 5 PACOLET, S. C.

August 2nd 1922

Mr. O. H. Johnson,
Newberry, S. C.

Dear Sir:-

We have used Hockaday's Interior Wall Finish on our Mill Cottages for the last five years, having used about three cars during that period, and same has given us entire satisfaction.

We consider same as good as any inside paint on the market.

Yours very truly,
Pacolet Mfg. Company,
By J. B. Montgomery

JBM/J.

HOCKADAY

THE WASHABLE FINISH FOR ALL INTERIORS

Progress Picture Showing new Addition to the Loray Mills, Gastonia, N. C., for the Jenckes Spinning Company of Pawtucket, R. I. Aberthaw Construction Company, Contractors.

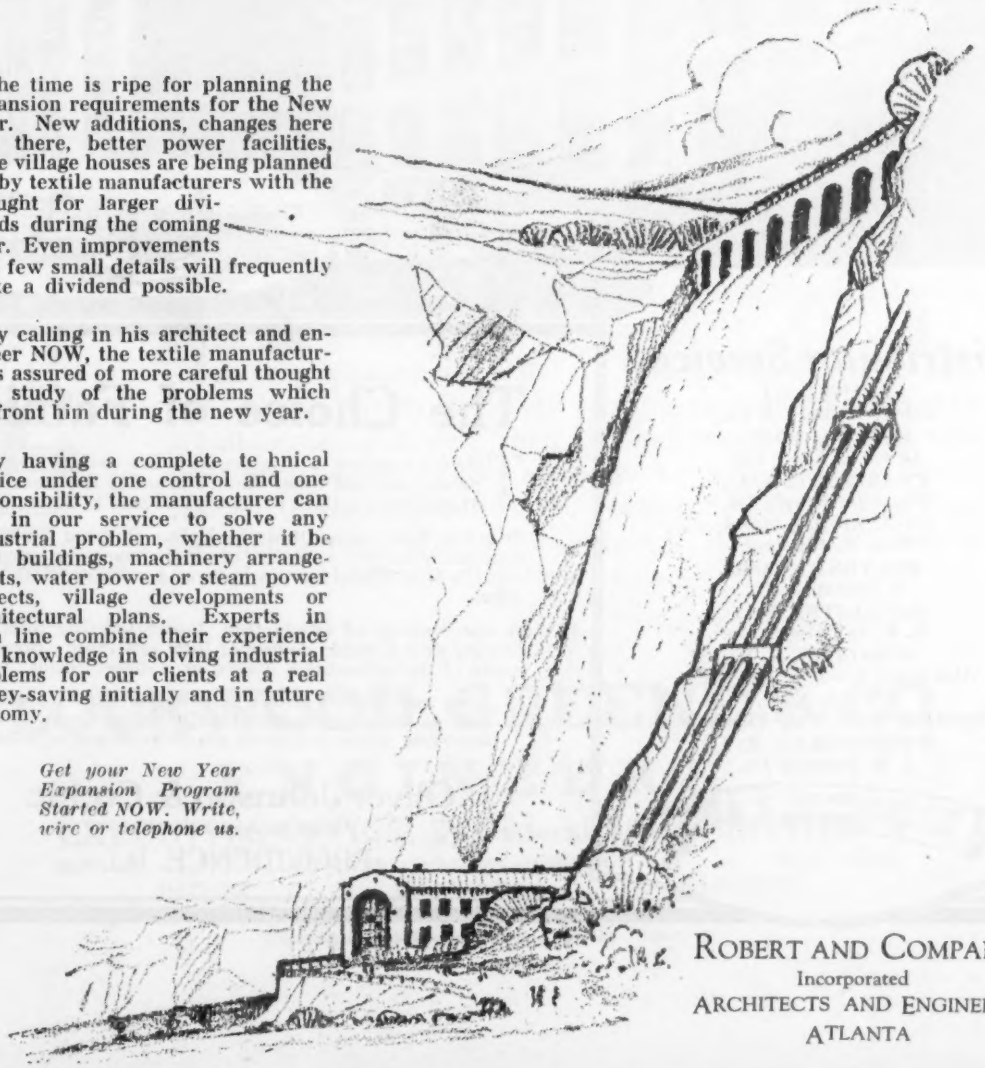
YOUR NEW YEAR EXPANSION PROGRAM

The time is ripe for planning the expansion requirements for the New Year. New additions, changes here and there, better power facilities, more village houses are being planned for by textile manufacturers with the thought for larger dividends during the coming year. Even improvements in a few small details will frequently make a dividend possible.

By calling in his architect and engineer NOW, the textile manufacturer is assured of more careful thought and study of the problems which confront him during the new year.

By having a complete te hnical service under one control and one responsibility, the manufacturer can call in our service to solve any industrial problem, whether it be new buildings, machinery arrangements, water power or steam power projects, village developments or architectural plans. Experts in each line combine their experience and knowledge in solving industrial problems for our clients at a real money-saving initially and in future economy.

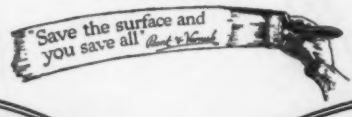
Get your New Year Expansion Program Started NOW. Write, wire or telephone us.



ROBERT AND COMPANY
Incorporated
ARCHITECTS AND ENGINEERS
ATLANTA

Distributor Service

ATLANTA, GA.
Robert G. Barr & Co.
BOSTON, MASS.
Lewis E. Tracy Co.
CHARLOTTE, N. C.
Charlotte Supply Co.
FALL RIVER, MASS.
Wm. F. Harticon
HOLYOKE, MASS.
J. Russell & Co.
ROCHESTER, N. Y.
F. P. Van Hosen Co.
SYRACUSE, N. Y.
Alexander Grant's Sons & Co.
UTICA, N. Y.
American Hard Wall Plaster Co.
WOONSOCKET, R. I.
J. B. Farnum Co.



The Choice of Fafnir!

THAT a concern whose products are designed to save power, oil and labor should practice the same kind of efficiency within its own plant was to be expected.

It is for this reason that the Fafnir Bearing Company, nationally-known makers of ball bearings, specified OJACO Mill White for the walls and ceilings of its great plant.

A speeding-up of production, lower lighting bills and the greatest possible degree of light reflection—these are some of the advantages gained as a direct result.

Upon request the nearest distributor listed opposite will gladly explain why OJACO Mill White is an important factor in lighting effectiveness and economy.

Oliver Johnson & Co., Inc.
Paint Makers since 1833
PROVIDENCE, R.I.

WORKING BACK *from the* CUSTOMER

A successful manufacturer of a popular product in the Middle West gave this as his recipe for success:

"Begin at the customer and work back."

Nothing could more aptly describe the traditional attitude of Lockwood, Greene & Co. toward their obligations to clients. Customer-interest is the first consideration. Ninety-two years of experience have proved it to be the most profitable policy.

The men in the Lockwood-Greene organization are trained to plan a factory or design a building as if it were their own investment. They are trained to put themselves in the client's place and to temper their idealism with the practicable requirements of the client's business.

The service of Lockwood, Greene & Co. includes the counsel of engineers, architects and men of broad business experience. It includes every service required in the building of a new plant or the extension of an old one, from the selection of a site to the letting of contracts and supervision of construction. It is a completely rounded organization of experts, covering every branch of engineering and practically every class of industrial building.

Whether you are contemplating an immediate program of building or not, we want you to have a copy of the booklet, "Building with Foresight." It will be sent on request.

Building With Foresight

LOCKWOOD, GREENE & CO.

ENGINEERS

EXECUTIVE OFFICE, 24 Federal Street, BOSTON 9

BOSTON ATLANTA CHICAGO NEW YORK
DETROIT CLEVELAND CHARLOTTE

Lockwood, Greene & Co. of Canada, Limited, Montreal
Compagnie Lockwood Greene, Paris, France

The chief *leaps from his chair*

at the first wrong note in the drone of the turbine

—And you may be sure that the engine room force gets busy.

They all know that the *turbines must not stop.* And engineers know, too, that the turbine must have a constant stream of clean, cooling oil.

They recognize that this condition can only be maintained with good clean oil of the right quality and with the proper characteristics for the work.

Recognition of these facts has brought about the selection, adoption and standardization of TEXACO Turbine Oils in many of the best run power plants in the world.

Here's a quick outline of some of the reasons for their unparalleled success:

Steam Turbine Operators prefer TEXACO Turbine Oils because

1—They do not break down with continued use.
2—TEXACO Turbine Oils do not emulsify.
3—They do not hold water in suspension
4—They do not cause corrosion of shafts and bearings.
5—They are uniform. Barrel after barrel, bought any time or any place, will exhibit the same physical characteristics.
6—They are economical because due to negligible evaporation and absence of decomposition, only a very little additional oil is needed to make up the small natural losses.
7—They are obtainable instantly at any of our numerous stations and warehouses all over the country.

The following TEXACO Turbine Oils are recommended:

Ring Oiler Bearings, *Normal conditions* ---------- **TEXACO REGAL OIL**
Ring Oiler Bearings, *Exposed to high temperatures* ---------- **TEXACO ALCAID OIL**
Circulating Oiling Systems, *Direct drive* ---------- **TEXACO REGAL OIL**
Circulating Oiling Systems, *Reduction geared* ---------- **TEXACO ALCAID OIL**

Write for a copy of our booklet "Lubrication of the Steam Turbine"

There is a TEXACO Lubricant for Every Purpose.

COUPON

Kindly send me Free a copy of your booklet "Lubrication of the Steam Turbine."

THE TEXAS COMPANY, U. S. A.

Texaco Petroleum Products

Dept. O, 17 Battery Place, New York City

Sold the world over

Name ---------- *Street* ----------

City ---------- *State* ----------

1-23

Get Better Service from Your Trucks

Install a Bowser gasoline pump and settle on one grade of gasoline for your trucks.

A Bowser removes all moisture and dirt from the gasoline as it passes into the car. This insures most mileage and less carburetor and carbon-caused engine trouble.

The Bowser provides further economies too by enabling you to buy gasoline at wholesale prices.

Booklet A-45 tells how to make your truck service more dependable. Get it at once.

S. F. Bowser & Company, Inc.

Pump and Tank Headquarters

Home Plant: Fort Wayne, Indiana • Canadian Plant: Toronto, Ontario

Factories and Warehouses: Albany, Dallas, Milwaukee, San Francisco, Sydney
District and Sales Offices: Albany, Atlanta, Baltimore, Boston, Buffalo, Chicago, Cleveland, Columbus, Dallas, Denver, Detroit, Kansas City, Los Angeles, Minneapolis, New York, Oklahoma City, Philadelphia Pittsburgh, Portland, St. Louis, San Francisco, Toronto, Washington.
Representatives Everywhere

Branch Offices with Service Departments in Principal Cities in this Country and Abroad

BOWSER
ESTABLISHED 1885
ACCURATE MEASURING PUMPS

Bowser Products

For Handling Gasoline and Oils Wherever Sold or Used

Filling Station Pumps and Tanks for Gasoline.

Storage and Measuring Outfits for Paint Oils, Kerosene and Lubricating Oils.

Portable Tanks for Gasoline and Oil.

Power Pumps.

Dry Cleaners' Underground Naptha Clarifying Systems.

Carload Oil Storage Tanks.

Richardson-Phenix Oil Circulating and Filtering Systems and Force Feed Lubricators.

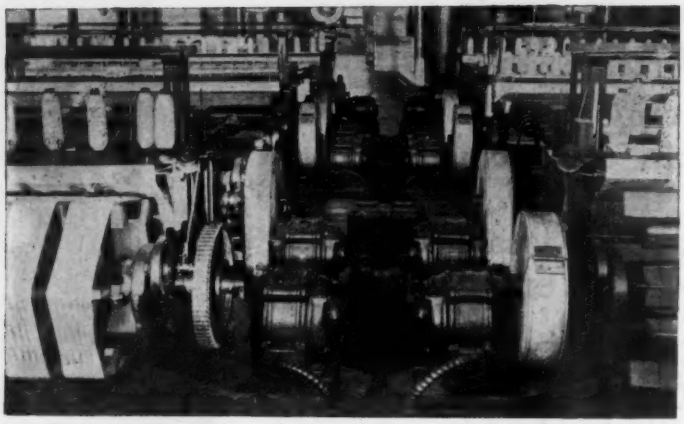
BY INVITATION MEMBER OF

MORSE SILENT CHAIN DRIVES

THE MORSE "ROCKER JOINT"

CHAINED POWER

A POWER SAVER FOR POWER USERS



Morse Silent Chain Drives run smooth, straight and true.
Used extensively in hundreds of textile mills

ASK FOR DATA ON REDUCTION OF OPERATING COSTS

Quiet, Clean, Durable and the most economical drive to maintain, Morse Chains permit 100% Overload on Short Centers with 99% efficiency—deliver full power without vibration, require minimum space allowing the best co-ordination. No worry about belt trouble, slippage, burning, stoppage to "take up" where Morse Drives are installed.

If this advertisement suggests a place, let Morse Engineers Cooperate to solve your drive problems.

Write Today for Booklet

MORSE CHAIN CO. — **LARGEST MANUFACTURERS OF SILENT CHAINS IN THE WORLD** — **ITHACA, N. Y.**

Morse Engineering Service — ***Assistance Without Obligation***

Benefit by Morse Service as Others Do

Address nearest office

ATLANTA, GA.....Candler, Bldg., Earl F. Scott & Co.
BALTIMORE, MD.....1402 Lexington Bldg.
BOSTON, MASS.....141 Milk Street
CHARLOTTE, N. C.....404 Commercial Bank Bldg.
CHICAGO, ILL.....Merchants Loan and Trust Bldg.
CLEVELAND, OHIO.....Engineers Bldg
DETROIT, MICH.....1361 Abbott St.
KANSAS CITY, MO.....Finance Bldg., Morse Eng'rg Co
NEW YORK CITY.....30 Church St.
MINNEAPOIS, MINN.....So. 3rd St., Strong-Scott Mfg. Co.
MONTREAL.....St. Nicholas Bldg., Jones & Glassco Reg'd
PHILADELPHIA.....612 Franklin Trust Bldg. 18-22 South 15th Street
PITTSBURGH, PA.....Westinghouse Bldg.
SAN FRANCISCO, CAL.....Monadnock B'dg.
ST. LOUIS, MO.....Chemical Bldg., Morse Eng'rg Co.
TORONTO..Bank of Hamilton Bldg., Jones & Glassco Reg'd
WINNIPEG, MAN .....Duffer.n St , Strong-Scott Mfg. Co.

"MORSE" is the Guarantee Always Behind the Efficiency, Durability and Service

POWER
Travels an Efficient Path

COCHECO
BELTING

Leather belting of the best quality, properly cared for, is probably the most all-round efficient power transmission medium. No matter where you use it, you'll find you can't buy better than Cocheco—and for good reason.

Cocheco Belting is made from the backbone center stock of selected hides; it is oak tanned by carefully developed processes. Cost is not considered in its making, yet the service it gives makes it one of the least expensive on the market.

Send for Cocheco Belting Booklets. They'll be interesting and valuable no matter what kind of leather belting drives your machines.

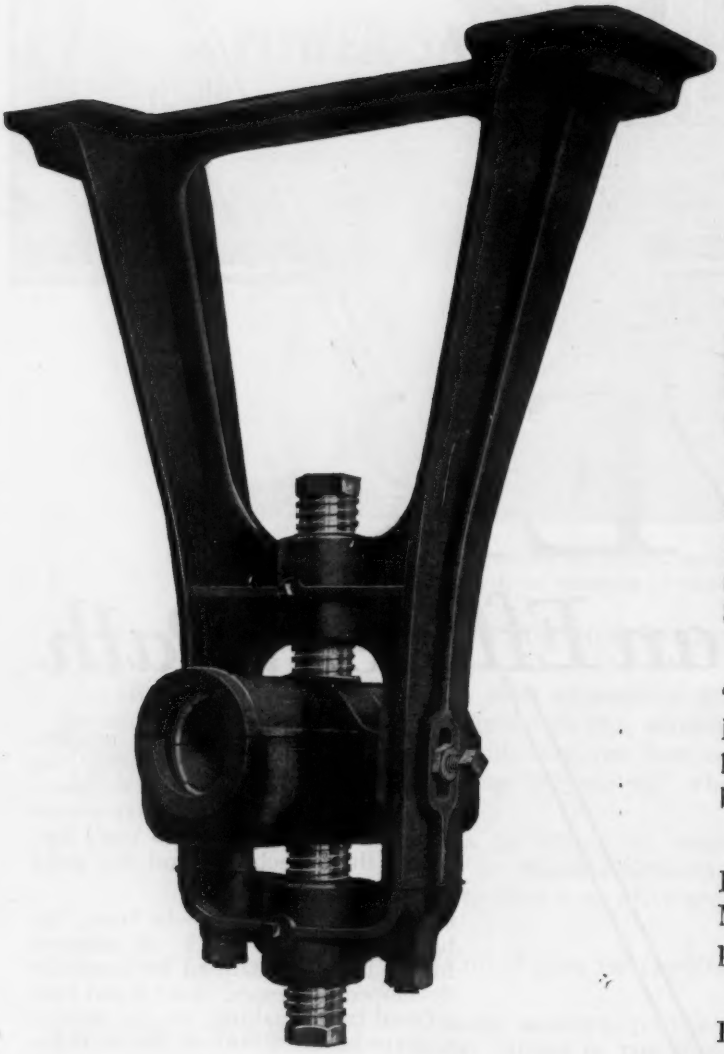
I. B. WILLIAMS & SONS

DOVER NEW HAMPSHIRE. U. S. A.

BOSTON, MASS., 157 Summer St. NEW YORK, N. Y., 71-73 Murray St.
CHICAGO, ILL., 14-16 N. Franklin St.

MACHINERY

CAST-IRON HANGERS



"Universal Giant" Ring Oiling Ball and Socket Hangers are Made of Cast Iron and are Practically Indestructible.

CAST IRON is the only material that will give the rigidity and strength needed to support Line Shafting.

"UNIVERSAL GIANT" CAST IRON Hangers are non-flexible and hold the shaft in position without bending or working apart.

BALL AND SOCKET ADJUSTMENT reduces friction and insures perfect alignment of shafting.

RING OILING BEARINGS provide positive Automatic Lubrication.

T. B. WOODS' SON'S CO., CHAMBERSBURG, PA.

MANUFACTURERS OF SHAFTING, COUPLINGS, SET COLLARS, HANGERS
PILLOW BLOCKS, PULLEYS, ROPE SHEAVES, FRICTION CLUTCHES, BELT TIGHTENERS

Spinning and Twisting Cylinders Should Always Be Strom Ball Bearing Equipped

There is a very attractive saving in power, freedom from flying oil spatter, saving of oil, and the labor of oiling, and greater ease in starting where Strom bearings are used.

Where individual motor drives are used, Strom Bearings are particularly desirable. They will stand the severepull of a small sprocket drive better than plain bearings, and will run cool at all loads and speeds.

Strom Ball Bearings can be furnished by any maker of spinning or twisting frames on new installations at a very moderate cost. Specify them when buying new equipment.

For bearings to apply to old frames, write to the Aldrich Machine Works, 529 Reynolds St., Greenwood, S. C., Textile Distributor for Strom Bearings.

U. S. BALL BEARING MFG. CO.
(Conrad Patent Licensee)
4544 Palmer Street **Chicago, Ill.**

Strom BEARINGS

"Wherever a Shaft Turns"

235

HUNTER
MANUFACTURING & COMMISSION CO.,

58-60 Worth Street New York City

Selling Agents for

Southern Cotton Mills

Fabrics for Home and Export

Domestic Branch Offices

Boston Chicago San Francisco Philadelphia
Baltimore St. Louis Greensboro
Cleveland Atlanta Kansas City

Foreign Branch Offices

Buenos Aires, Argentina
Santiago, Chile
Baranquilla, Colombia
San Juan, Porto Rico
Curacao, D. W. I.
Havana, Cuba
Catracas, Venezuela
Manila, P. I.

SOLE DISTRIBUTORS
to the
JOBBING AND WHOLESALE TRADE
for the
DURHAM HOSIERY MILLS

SAYLES FINISHING PLANTS, Inc.

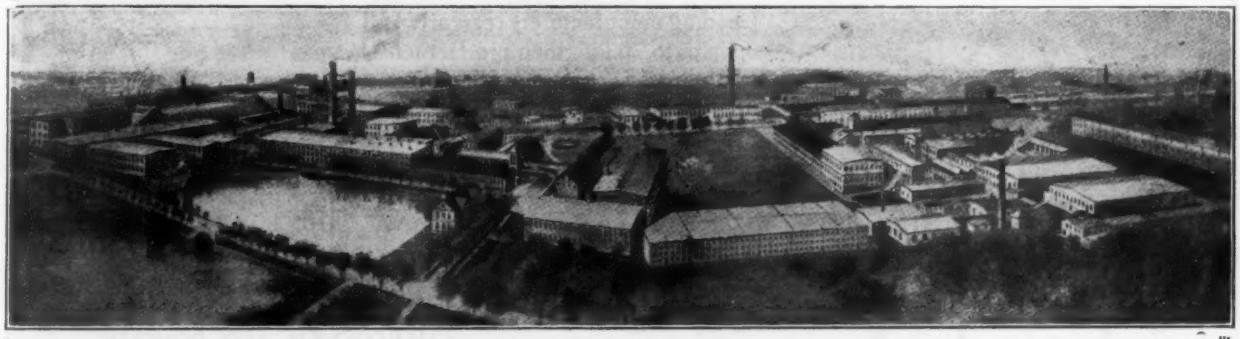
SAYLES BLEACHERIES	SAYLESVILLE, R. I.	PLANT A
GLENLYON DYE WORKS	SAYLESVILLE, R. I.	PLANT B
GLENLYON PRINT WORKS	PHILLIPSDALE, R. I.	PLANT C
GLENLYON YARN DYE WORKS	PHILLIPSDALE, R. I.	PLANT E
GLENLYON YARN DYE WORKS	CENTRAL FALLS, R. I.,	Winding Dept.
NEW YORK OFFICE	72 LEONARD ST., NEW YORK CITY	

SAYLES BLEACHERIES

BLEACHERS AND FINISHERS OF COTTON FABRICS

Wide Sheetings, Shirtings, Lawns, Fancy Dress Goods, India Linens, Nainsooks

ALL WEIGHTS AND WIDTHS



VIEW OF SAYLESVILLE WORKS

GLENLYON DYE WORKS

Mercerizers, Dyers and Finishers of Cotton Piece Goods

GLENLYON PRINT WORKS

Bleachers, Dyers and Printers of Fine Cotton Goods and Fabrics of Silk and Cotton

GLENLYON YARN DYE WORKS

Bleachers and dyers of cotton yarn in ball warps and skeins, artificial and natural silk yarns.
Colors fast to bleaching a specialty.

GLENLYON YARN DYE WORKS

Winding Department

Beamers, Warpers, Winders and Quillers

FOR GENERAL INFORMATION

Address

SAYLES FINISHING PLANTS, Inc.

Saylesville, R. I.

Picking up the PILOT

FOR the safety of the ship and passengers, the skill and knowledge of the pilot are called into service in making port.

The wise manufacturer does not attempt to bring his product to a state of completion without the guidance of those who supply the materials he uses.

Leading manufacturers regularly call upon us to "pilot" their products clear of technical difficulties into the port of smooth production.

"HAWK" THIN BOILING STARCH

"BEST" BRAND WHEAT STARCH

"ROYAL" TAPIOCA FLOUR

IMPORTED AND DOMESTIC POTATO STARCH

DEXTRINES AND DRY GUMS FOR FINISHING, PRINTING AND BLEACHING

OUR *new* PRODUCT FOR IMPROVED SIZING IS CALLED

"SOLUBLE WHEAT STARCH BINDER"

(made from pure wheat)

USED IN COMBINATION WITH STARCH, THE RESULT IS

STRONGER WARPS
NO SHEDDING
ADDED WEIGHT

STEIN, HALL & COMPANY

INCORPORATED

MANUFACTURERS AND DIRECT IMPORTERS

61 BROADWAY EXECUTIVE OFFICES NEW YORK

BRANCHES:

PHILADELPHIA BOSTON CHICAGO SAN FRANCISCO
GREENVILLE, S. C. CHARLOTTE, N. C. TROY, N. Y.
PROVIDENCE, R. I. ROTTERDAM, Holland

"The Hallmark of Quality"

Organized Dyeing Talent

As an adjunct to the Textile Mill, maintenance of complete dyehouse equipment directed by operatives of sufficiently flexible skill and experience to surmount the most intensive demands presented, is as a rule, wholly impractical.

Hence recourse to an organization of talent accustomed to constant contact with practical and artistic color treatment of Fine Fabrics in the piece, is welcome indeed to the producer whose aim it is to offer the broadest range of facility to an exacting clientele.

Being pioneers in the scientific application of color treatment, our sphere is essentially the *intricate phases of dying, printing, finishing.*

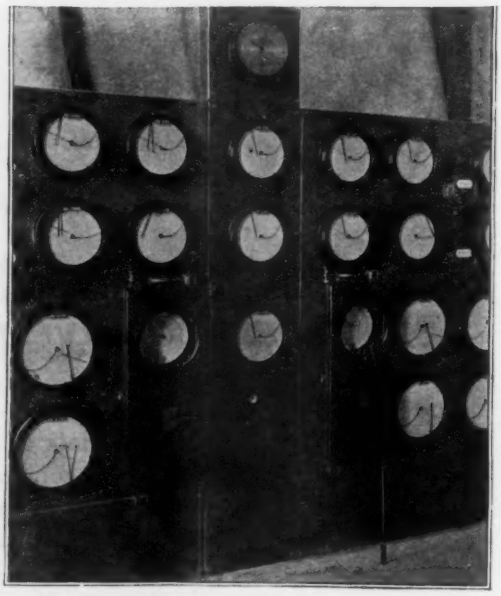
United Piece Dye Works

DYERS, PRINTERS AND FINISHERS
IN THE PIECE OF

ALL COTTON GOODS
SILK AND COTTON MIXED GOODS
SILK AND WOOL, ETC.

New York Office
132 Madison Avenue

Mills
Lodi and Hawthorne, N. J



AS VALUABLE TO YOU AS THE COMPASS TO THE MARINER

We make **Indicating and Recording Liquid Level Gauges, Thermometers, Pressure Gauges, CO_2 Recorders, Temperature Controllers,** etc., for use on
Size Boxes
Dye Tubs
Bleaching Kiers
Slashers
Drying Machines
Kettles
Steaming Boxes
Drying Cans
Woolwashers
and for the Power Plant.

Imagine operating your size boxes or dye tubs without thermometers or your power plant without gauges.

You will probably agree that without indicating and recording instruments of some kind your plant would be like a ship without a compass.

Isn't it, therefore, of the utmost importance that your instruments be absolutely trustworthy?

Foxboro Instruments are built with a knowledge of the need for permanent dependability. The Foxboro improved helical tube movement is an effective combination of sensitiveness and strength, the result of painstaking development. The three point support clock movement was designed especially by Foxboro engineers to insure maximum dependability. Other details of design emphasize this single purpose—dependability.

Every Foxboro Instrument must pass tests which prove it worthy of its responsibility as a Compass of Industry.

Write to Dept. AS for complete information about any or all of our instruments.

THE FOXBORO CO., INC.

FOXBORO, MASS. U. S. A.

New York Chicago Boston Tulsa
Pittsburgh Philadelphia San Francisco Birmingham
Peacock Brothers, Limited, 179 Delorimier Avenue, Montreal, Canada

FOXBORO

TRADE MARK

THE COMPASS OF INDUSTRY

4600

—34 Years is a good long time for drying cylinders to be in service

If you remember, about a couple of months ago we said on this page that as we found Butterworth machines which had been in constant use for a comparatively great number of years, we would tell you of them.

At that time we were speaking of a calender that had been in use daily since 1859.

Well, a few weeks ago one of our representatives calling at a finishing plant was taken out in the works by the owner who, in an accusing voice, said, "When I bought that range of drying cylinders over there, you folks told us that they would last ten years—fact is, you guaranteed them for that long."

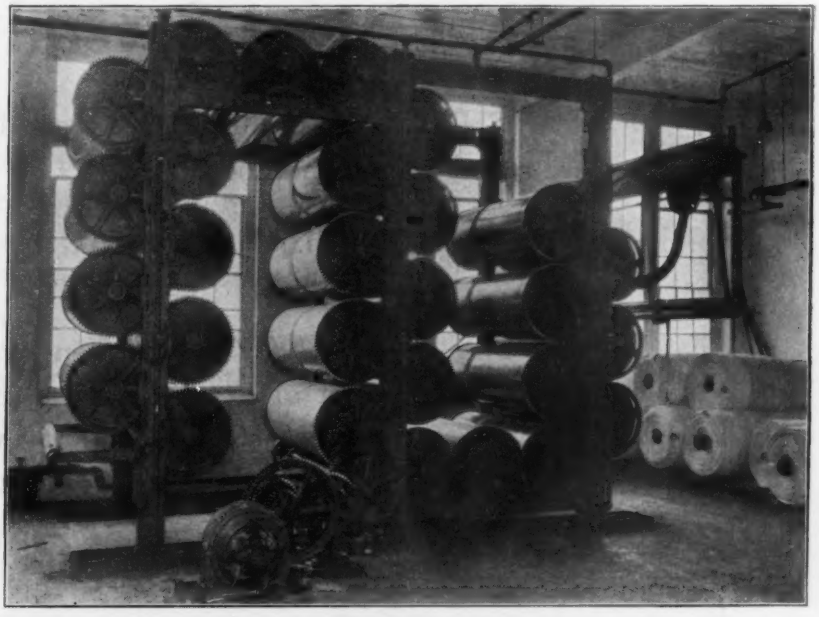
"I hope that—" began our representative.

"Hope nothing! Those cylinders have been in use every day for thirty-four years and they are good yet. Why don't you tell the truth about your goods?"

Need we add that these are the kind of "complaints" we like to hear, whether they are about dryers, calenders, tenters or any other Butterworth product.

H. W. BUTTERWORTH & SONS CO.
Established 1820
PHILADELPHIA, PA.

Canadian Representative: W. J. Westaway Company, Hamilton, Ontario, Canada
Providence Office: Turk's Head Building
Greenville, S. C. Office: Masonic Temple Building, Milton G. Smith, Manager



Here is a twenty-eight cylinder dryer

Each cylinder is copper, (we also make them of tinned steel) 23" diameter by 84" between the bands. The drive is by a 10 H. P. 1200 R.P.M. motor. The gears are a special train and allow the changes of speed required by the work being done.

BUTTERWORTH *Finishing* MACHINERY

Starch

400 MILL
500 MILL

FAMOUS N
C. P. SPECIAL

Blue River Crystal

These STARCHES are manufactured by carefully controlled and standardized methods.

PURITY and UNIFORMITY are secured by accurate laboratory tests.

ECONOMY and EFFICIENCY are proven by the constantly increasing number of exacting cotton manufacturers who are getting satisfactory results by using our STARCHES especially selected for their conditions.

Recommendations are based upon intelligent investigation of each individual problem.

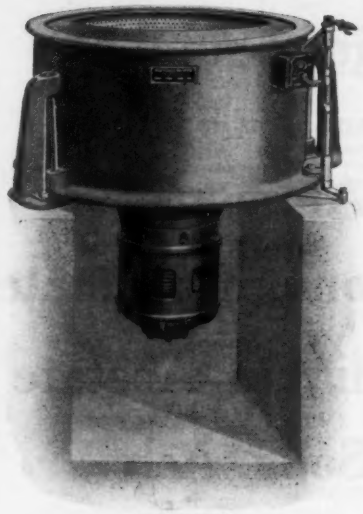
Corn Products Refining Company

New York

Southern Office *Greenville, S. C.*

Starch

FLETCHER MOTOR DRIVEN HYDRO EXTRACTORS



TYPE EU
Electric Underdriven Extractor

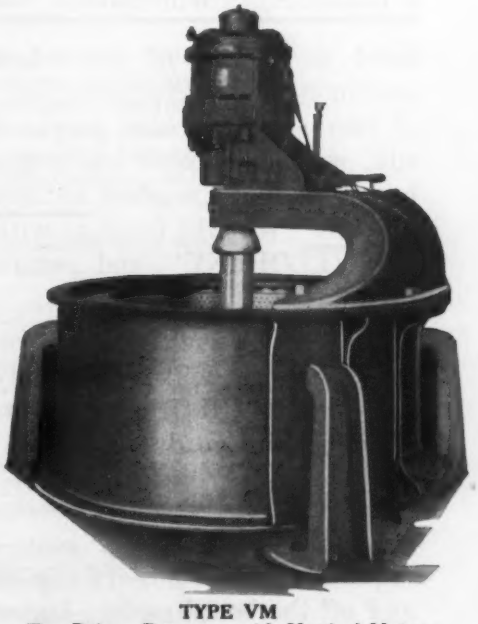
are designed to get up to speed in the shortest possible time, to stop quickly, and to require the minimum amount of attention.

A touch on the button takes care of the starting.

Application of the brake lever automatically shuts off the current.

Whether your choice is the underdriven whizzer with the rotor on the basket shaft, or the top driven machine with its direct connected vertical motor, you have the satisfaction of knowing that there is practically no maintenance cost.

Because there are no belts, clutches, or other complicated driving mechanism to wear and need repair, upkeep charges are so small that they may be disregarded.



TYPE VM
Top Driven Extractor with Vertical Motor

FLETCHER WORKS

(Formerly Schaum & Uhlinger)

Glenwood Avenue and Second Street

PHILADELPHIA, U. S. A.

Southern Representative: HOWARD MORSHEAD GLENWOOD AVE and 2nd ST., PHILADELPHIA, PA.
New England Representatives: HURRICANE ENGINEERING COMPANY, 53 STATE ST., BOSTON, MASS.
Western Representatives: R. R. STREET & CO., 28 N. CLINTON ST., CHICAGO, ILL.

Manufacturers of Fletcher Narrow Fabric Looms

"DEVELOPENE"

Leaves No Argument as to When

"BLACK IS BLACK"

WHY BE SATISFIED

with a RUSTY BLACK when you can have a RICH LUSTROUS BLACK by finishing your Hosiery with the latest, most efficient and satisfying patented preparation.

"DEVELOPENE"

A Demonstration Will Convince You

Send us a pair of unfinished stockings, skein of yarn or a piece of fabric—cotton, silk, artificial silk, wool or mixes—which has been dyed black, washed, but not finished. We will finish it with "DEVELOPENE" and return to you.

There will be such an improvement that you will immediately want "DEVELOPENE" for finishing your goods.

No further softener—or soap—required. Makes hosiery slip on and off the board easily—leaves the product soft and pliable.

Glauber Salt

Formaldehyde

Sodium Sulphide

Single and Double Strength—

Ammonia

Ammonium Acetate

Aluminum Acetate

Soda Ash

Caustic Soda

Turkey Red Oil

Kali Chlorine Neutralizer prevents Tender Bleached Goods

Kier oil for removing oil stains.

Hydroxy Silk Soap—
Hydroxy Red Oil Soap—
Scouring Oil—
Degumming Oil for Silk.

Kali Manufacturing Co.

Manufacturing Chemists

1404-10 No. Front St. **PHILADELPHIA, PA.**

Sole Manufacturers of

Hydroxy Oil and Kali Chlorine Neutralizer

MATHIESON Chemicals

MATHIESON Chemicals are being used more and more by Southern mills because they assure absolute purity and uniformity. We can guarantee this as every ounce is made in our plants, where frequent tests prove the quality of the product throughout every step of manufacture. The Mathieson standard is rigidly maintained.

When you order from our Southern Office—in the very heart of the Southern textile industry—you get prompt delivery and lower freight rates as shipment is made at once from our plant at Saltville, Va., or from the nearest of our centrally located distributing points throughout the South.

Some of the Mathieson Chemicals most widely used in the South are:

LIQUID CHLORINE: A better, safer, 100 per cent. pure bleaching agent that gives the cloth a softer feel, a cleaner coloring and a greater tensile strength—no danger of goods yellowing or tendering.

BLEACHING POWDER: The highest test and most stable bleach manufactured.

SODA ASH: 58 per cent. Pure Alkali—both light and dense. Shipments in bulk, bags and barrels.

CAUSTIC SODA: The electrolytic 78 per cent. grade analyzing 98.70 per cent. Hydrate of Soda, is the purest caustic made. Also 76 per cent. and 74 per cent. grades, solid, ground or flaked.

BICARBONATE OF SODA: Purest grade, powdered and granular.

VIRGINIA SODA (Sesquicarbonate of Soda): A beautiful white crystalline product, uniform in character and action. A superior neutral textile soda for washing and scouring.

Write, wire or telephone our Southern Office:
Commercial National Bank Building, Charlotte.

MATHIESON ALKALI WORKS INC.
25 West 43rd Street
NEW YORK CITY
PHILADELPHIA CHICAGO
PROVIDENCE CHARLOTTE

EAGLE THISTLE PRODUCTS

Deal Direct with the Manufacturer

Beam Bleaching and Dyeing

(Brandwood's Patents)

Up to twelve Beams, Bleached or Dyed at One Operation, Indigo, Vat, Napthol, Sulphur and Direct Colors.

Cost in labor and materials guaranteed less than by any other System.

We give definite guarantees in our Contracts as to cost of labor and materials and quality of work.

Users of our Bleaching and Dyeing Plants have the exclusive free benefit of Twenty United States Patents, giving great advantages in Warping, Bleaching, Dyeing, Drying, Quilling and Splitting, and not available by any other System.

We further give the use of valuable secret processes, and many years' practical experience. We start up the Plants free, and give free service at all times.

Reckoned on basis of production, our Plants are cheapest in first cost.

We are prepared to install Plants and take payment, as and when saved by their use.

Most of the Chambrays and stripes now manufactured in the U. S. and Canada, are bleached and dyed on our Plants.

Exclusive Patent Rights are still available for some States and Territories.

Raw Stock Bleaching and Dyeing

(Brandwood's Patents)

Bleaching or Dyeing continuously in One Apparatus up to fifteen hundred pounds per hour, Indigo, Vat, Naphtol, Basic Developed, Sulphur and Direct Colors.

Cost in Labor and Materials guaranteed less than by any other system.

Dyehouse labor in handling the cotton before and after dyeing, and hydro-extracting is eliminated.

Three-fourths of the labor costs and three-fourths of the dyehouse floor space is saved.

Spinning production considerably increased.

No shortening, weakening or matting of the cotton.

Colors brighter and evenly dyed.

We give definite guarantees in our Contracts as to cost of labor and materials and quality of work.

We start up the Plants free and give free service at all times.

Exclusive Patent Rights are being granted to Colored Goods Manufacturers for their own State or Territory.

For full particulars apply to

JOHN BRANDWOOD

ELTON COP DYEING CO., LTD.

BURY, ENGLAND

Staley's Starch

IMPROVES QUALITY
REDUCES COST

Even more important than the economy of Staley's Eclipse Thin Boiling Starch is the improvement in quality of output made possible.

Seconds are virtually eliminated, and there is minimum shedding at the looms. Fibers of the yarn are thoroughly cemented together, increasing tensile strength 10% to 15% more than thick starches. This assures excellent weaving, with a smooth, pliant warp as the result.

Service of this character, consistently maintained, has made Staley's Eclipse Thin Boiling Starch the standard of the textile industry. Write for samples and prices.

A. E. STALEY MFG. CO.

DECATUR, ILLINOIS

508 Andrews-Law Bldg., Spartanburg, S. C. | J. W. Pope, Ansley Hotel, Atlanta, Ga. | 25 Church St. New York City | 88 Broad St., Boston, Mass.

Catalogs

Stuffers

Booklets

Display Cards

Tags Stickers

General Office Literature

Illustrated View Books

All forms of Special Advertising Literature

Illustrated Price Lists

Folders

Labels

Boxes

Illustrations of Plants

Machinery

Portraits

Factory Products

Homes

Let Us

Visualize Your Ideas

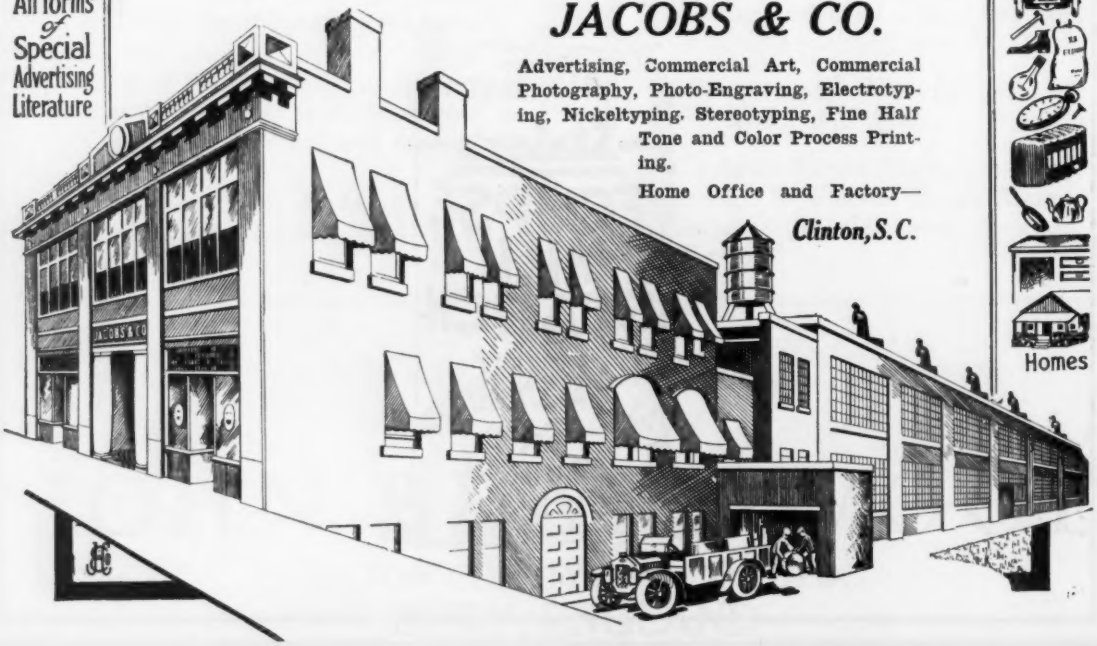
Most wide-a-wake business men are constantly originating ideas, sales and advertising plans, which, if carried into execution, would be the means of producing improved business and greater sales.

Possibly you have the ideas which you have failed to use, the lack of technical knowledge covering advertising and publicity plans alone discouraging you.

Our occupation for over 23 years has been that of the crystalization of publicity plans for others. With a thoroughly equipped, most complete plant furnishing "anything and everything for the advertiser" we can carry your ideas into practical and successful execution.

May be it is a trade-mark, a slogan, literature or some special form of illustration, or perhaps it is a long needed treatise or exposition of your plant, your product, your service. Whatever it is, our artists, ad-writers, engravers, electrotypers, printers,—in short, our advertising experts —will gladly carry your ideas into execution and further improve them by the production of new ideas, the conception of better expression and of new thought.

Whatever your problem is, write us.



JACOBS & CO.

Advertising, Commercial Art, Commercial Photography, Photo-Engraving, Electrotyping, Nickeltyping. Stereotyping, Fine Half Tone and Color Process Printing.

Home Office and Factory—

Clinton, S. C.

UCPC

ANILINE COLORS

DIRECT, SULPHUR, ACID, BASIC AND CHROME
including the following new colors

DIRECT SKY BLUE T CONC
DIRECT BLUE 2 B CONC
DIRECT BLUE 3 B CONC
DIRECT FAST BROWN M
DIRECT GREEN B CONC
NAVY BLUES
DIRECT BROWN GC CONC
CORDOVANS
SULPHUR YELLOW G SUPERIOR
SULPHUR NAVY BLUE NEW
DIRECT BLACK E. U. CONC.

VELVETEEN PASTE

THE STANDARD BOIL-OFF & DYE BATH ASSISTANT

U. C. TALLOW

THE HIGHEST GRADE OF PURE SIZING TALLOW

KING BRAND SIZING

OUR "K. B." IS A COMPLETE SIZE IN ITSELF. HIGH IN TALLOW

WAX SOFTENER

A SCIENTIFICALLY BLENDED SOFTENER FOR BLEACHED GOODS

UNITED CHEMICAL PRODUCTS CORPORATION

York and Colgate Sts. . . . . Jersey City, N. J.

Southern Office, Commercial National Bank Bldg., Charlotte, N. C.

REPRESENTATIVES: R. T. GRANT, Charlotte, N. C.
GEO. W. WATSON, Hazelhurst, Miss.

NATIONAL U.S.A. DYES

"NATIONAL" SULFUR BLACKS

Solubility in comparatively small amounts of Sodium Sulfide—is the quality the machine dyer looks for in Sulfur dyes. The following three "National" types are of this character. Each, moreover, is of excellent fastness to light, water, fulling, cross dyeing, perspiration, hot pressing, rubbing, alkali, and acids. Excellent fastness to light and washing makes these dyes valuable for use on hosiery and raw stock.

National Sulfur Black B G Extra Conc—
the greenest type

National Sulfur Black R—
much redder than the National Sulfur Black B G Extra but greener than National Sulfur F Paste

National Sulfur Black F Paste—
of reddish shade

Send to nearest branch office for samples and quotations. If desired we will submit dyeings on your stock.

National Aniline and Chemical Company, Inc.

40 Rector Street, New York, N. Y.

New York *Chicago* *Charlotte* *Toronto* *Philadelphia*
Boston *Hartford* *Montreal* *Providence* *San Francisco*

COTTON

Published Monthly by

W. R. C. Smith Publishing Co., Dalton and Atlanta, Ga.

L. L. ARNOLD, Editor. **R. W. PHILIP, Associate Editor.**

Editorial and Advertising Departments, Grant Building, Atlanta, Ga. Subscription price, $1.00 per year; Canada, $1.50 a year; Foreign, $2.00 a year. Entered at the Dalton, Ga., postoffice as second-class matter.

Contributions to the columns of Cotton are solicited and paid for after publication. The name of contributors need not necessarily be used, but must accompany all manuscripts.

Orders for any change in advertising must reach Atlanta previous to the tenth of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

When changing address, notify us, not the postmaster. Always give the old address as well as the new one.

Member Associated Business Papers, Inc.

Volume 87 **Member Audit Bureau of Circulation.** **No. 3**

CONTENTS

EDITORIAL—

The Proposed Twentieth Amendment 169

The Next Congress 170

Is It the Referendum? 170

GENERAL AND TECHNICAL—

Cotton Goods in the Year 1922 171

Carders' Section Meets at Anniston 173

Northeast Brazil as a Cotton Producer 187

New Models for Cotton Warehouses 191

Cotton Growing Possibilities in Argentina 193

Northern Textile Operating Executives Have Practical Discussion at Fall River 196

A Review of the Year in Cotton 202

Some Notes on Size Regain 204

What the Southern Mills Are Doing 205

The New England Mill Situation 210

Notes About Men You Know 214

An Old-Timer Says 217

HOW OTHER MEN MANAGE—

Fly Frames and Differentials 219

A Discussion on Slashing 223

A Fly Frame Twist Problem 225

Does the Licker-In Comb the Stock? 227

The Efficient Weaving Overseer 229

A Device to Even the Card Sliver 233

Carding and Spinning Questionnaire 235

The Duties of the Efficiency Man 237

What Makes the Fingers Break? 244

Finds an Answer for "Nemo" 244

Asks for Opinions 244

KNITTING SECTION—

Perpetual Yarn Inventory for Knitters 247

Among the Knitting Mills 257

The Yarn Market 258

The Knit Goods Market 261

Knit Goods Show in April 266

The Year in Knit Goods 267

For Uniform Mercerizing -Hyatt Bearings-

Uniform mercerizing, so necessary to perfect, and even dyeing, can only be obtained by freely and easily turning mercerizer rolls.

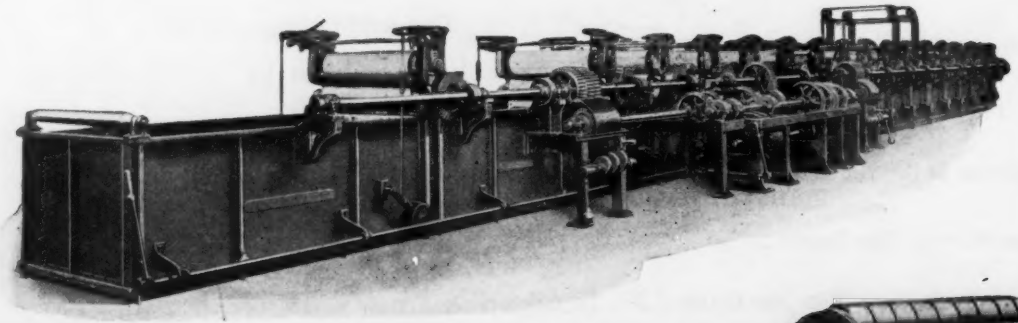
To insure this uniformity in the product of their mercerizers, the Textile Finishing Machinery Company has used Hyatt bearings for over 6 years.

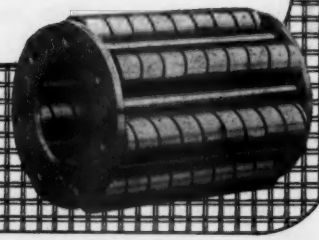
Additional advantages of Hyatt bearing mercerizer rolls are: *durability*, even in the caustic tank—*cleanliness*, due to the oil tight housings that prevent staining of yarn—*power saving*, the easily turning rollers reduce strain on yarn and require less power—*lubricant saving*, oil need only be applied 4 times a year.

To produce uniformly mercerized yarn at a lower cost per yard and dependably, specify that your mercerizers be Hyatt equipped—it pays.

Hyatt Roller Bearing Company
Worcester Newark Philadelphia

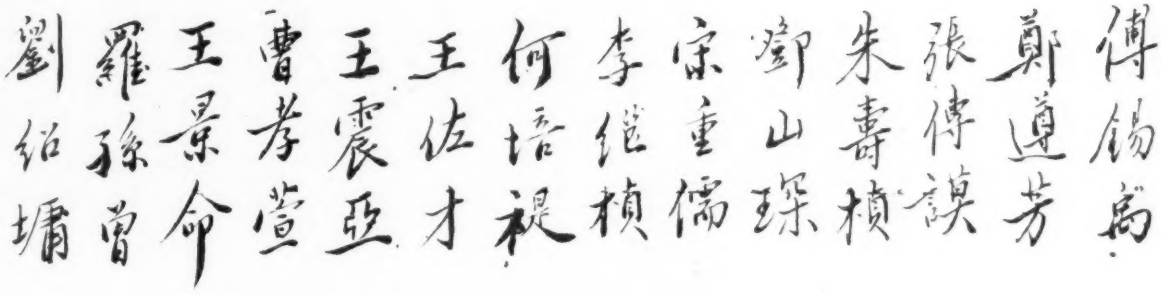
USE HYATT BEARINGS ON YOUR LINE SHAFTS TOO BULLETIN 121





To insure uniform mercerizing due to easily turning rolls, the Textile Finishing Machinery Company of Providence, R. I., has used Hyatt roller bearings for over 6 years. This gives their customers dependable, economical warp mercerizing at a lower cost per yard

With the Publishers—



A Chinese correspondent, in an article soon to be published in COTTON, concludes his discussion on Chinese cotton mills by pointing out that China needs American brands and American brains; that the progress of China means greater prosperity to the United States.

During the last few years American machinery manufacturers have installed about a million spindles in Chinese mills, China's total spindleage now standing at a little over the two million mark. "But," our correspondent continues, "China not only needs American machinery, it also needs American mill supplies, and will need raw materials and textile products of all kinds as time goes on."

The education of many young Chinese men in American colleges and universities, under the agreement concluded at the time of the Boxer Rebellion, has done much toward planting the seed of American ideals in China. These young men, upon their return to their own country, have in many instances achieved high places in the political, industrial and business life of their nation. They are leaving their imprint, with its peculiarly American cast or slant, upon the methods or means by which they obtain business success. And those in textile lines show this tendency by their friendly familiarity with American machinery, basing their preference on its simplicity and durability.

COTTON is also doing its part in this educational work by keeping these progressive Chinese leaders in touch with American precision and efficiency. That these efforts are appreciated is indicated by the constantly growing popularity of American methods and equipment, and by the number of Chinese subscribers that are being added from time to time to our lists.

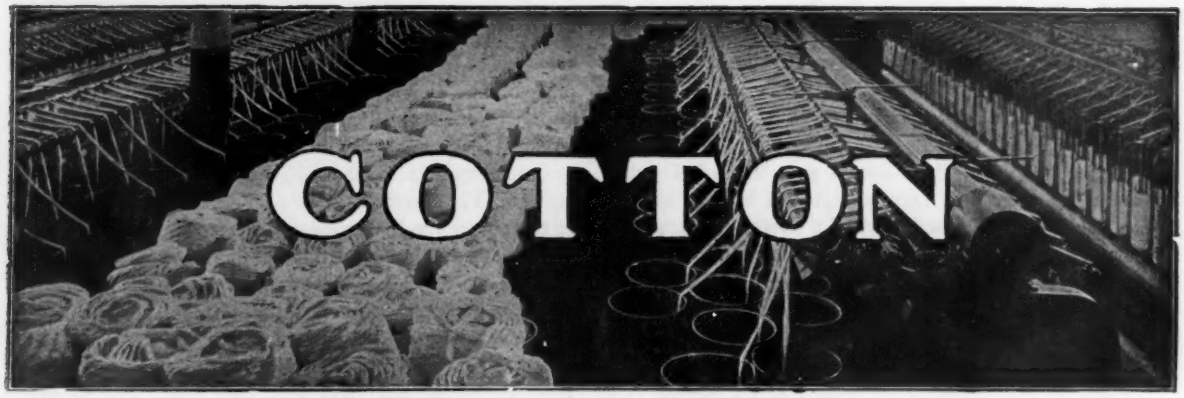
We are reproducing at the top of this page the Chinese signatures or names of fourteen of the twenty-eight new subscribers from China received during the last two months. Evidently Chinese mill men agree with the opinion expressed by the superintendent of the Le Roy (New York) Division of the Bay State Cotton Corporation who says, in a letter dated December 11, "I think COTTON is in a class by itself and as a textile journal is very instructive."

AMONG COTTON'S READERS

Frank W. Gurry, President,
Eatonton Cotton Mills,
Eatonton, Ga.

"Many years ago when a fixer in black shirt and overalls, COTTON was an inspiration to me. Today, as an executive, it means just as much to me, and I find the practical matters discussed through COTTON most interesting and helpful. The "ads" are equal to a Buyer's Directory."

F. W. Gurry



January, Nineteen-Twenty-Three

The Proposed Twentieth Amendment.

It has come to the point, it would seem, where like good deeds, one amendment to the Federal Constitution calls for another. Instead of half century periods elapsing between the making of additions to the nation's fundamental law, as of yore, it now appears that the Constitution must be tinkered with every few years.

Persons in high place now are urging two new amendments, one to give Congress control over child labor and the other to make public securities of all kinds taxable by both the States and the Federal Government. Both are of peculiar interest to business and industry, especially in the South. The first one is aimed particularly at the South and the last seems to find its chief opposition there. It is unlikely that the child labor amendment will come to final issue soon. But the other one bids fair to pass Congress within the next year; indeed, if it gets to a vote it is likely to be submitted before the present Congress expires on March 4.

The proposed Twentieth Amendment is singular in many of its aspects. Unlike those that have been adopted within the last few years virtually all schools of political thought appear to favor it. The violent radical is for it, as a rule, as ardently as the most conservative. Both President Harding and Secretary of the Treasury Mellon look upon it as almost absolutely necessary, not only as a governmental protection but as a social and economic safeguard as well.

In reality it will be more an amendment to the Sixteenth or income tax amendment (with which began the amending fever that has raged during the last dozen years) than a genuine addition to the Constitution.

For the Sixteenth Amendment, as with most of the additions to the Constitution, has not worked out altogether as was predicted by its friends and enemies. It was to make wealth bear a greater burden of national taxes and thereby bring about a decrease in ordinary taxes. It has been the means of greatly increasing Federal revenues and particularly from those sources that were believed to not bear their just parts of the tax burden. But, surprisingly, it has led to an increase in the volume of wealth which bears no taxes at all. And, instead of causing a reduction in ordinary taxes, it has led to phenomenal increases, not only in those levied by Congress, but in those imposed by the States, counties, cities, and other units.

The prime reason for these developments is the tax exempt security which, it is held, does not come within the purview of the income tax amendment. The heightening of the income tax, with surtaxes gauged as to sizes of incomes, has led many more persons of big incomes to become evaders not only of Federal but of all taxes than ever before was the case. They can do it by transferring investments to tax exempt securities. This means that productive industry is deprived of that capital and, having to meet the competition of the public bonds, has to pay more for the capital it gets than otherwise would be the case.

The public bond being in great demand there has become an epidemic, or rather an endemic, for it seems continuous, of what might be termed the public debt disease. Prior to 1913 never in a single year were bonds of a face value of as much as $500,000,000 sold by the States, the counties, cities, etc. In 1921, despite financial depression, bonds worth more than $1,300,000,000 were floated by those units of government. All are tax exempt.

Thus government—in terms of a single unit—while extending with one hand the tax net as never before, has with the other hand provided an easy method of escape for persons who could turn holdings into cash and invest the cash in government's own tokens of debt.

The "vicious cycle" thus set going has run to the point where even a man as conservative as President Harding is forced to declare that, if unchecked, it "may soon threaten the stability of our institutions." Dr. Seligman, Professor of Political Economy at Columbia University, says that unless something is done the national income soon will have to absorb annually from two to three billions of dollars worth of public securities. This would put a most dangerous strain on productive enterprise. Already there has been great decline in taxable incomes reported.

It seems that the only feasible thing to do is to amend the Constitution so as to bring all public bonds issued thereafter within the range of taxation, income or otherwise. This will make public bonds of future issue less desirable and, as a corollary, investments in taxable private enterprise more desirable. It also will protect the Federal Government's revenues, as well as all other taxes, now seriously threatened by the growing practice of escaping them via the tax-exempt security.

It is a curious necessity, and in many ways it partakes of evil being employed to correct evil. For in some respects it entrenches those wasteful practices growing out of unlimited Congressional power to raise and spend funds.

And not the least curious circumstance having to do with it is the real ground of some of the opposition that probably will develop. It comes chiefly from the South and is based ostensibly on State's Rights. The real reason for opposition in that case is more nearly the belief that the South profits from the present arrangement. The existing arrangement undoubtedly makes it possible to sell public bonds at lower rates of interest than will have to be paid when public bonds are taxed. As the South, or much of it, believes that it is dependent in great part on other sections for public loans it would seem to be the gainer by the conditions now prevailing. The truth of that contention depends largely on whether public debt, especially on a big and growing scale, is in itself profitable.

Whatever the curious ramifications of the subject it is evident to virtually all students of political economy, as well as to leaders in the National Government, that something must be done. The alternative to the proposed amendment it seems, would be the abandonment of the Federal income tax, a step, whatever its merit, that now is almost impossible because of the demand for revenues caused in large part by debts already contracted.

Thus the Constitution is to be amended, not in the matter of basic principle but in one largely of legislative detail, in order to confound evils flowing from a prior amendment. And government in reaching out so freely, as it has done in recent years, for new sources of revenue finds itself up against a wall which it can pass only by taxing itself. For a tax on public bonds is a tax on public credit, a very important part of government itself.

But it would seem that there's nothing else to do about it. There is one thing it should teach the public. And that is the importance of looking with suspicion on all proposed amendments to fundamental law. Rarely can anyone predict how they will operate in actual practice.

The Next Congress.

The eccentricity of elections again gives a peculiar cast to Congress. In a general sense the only fixed likeness between the Congress chosen in November 1922 and that elected in 1920 is that both are far different from the average Congress, but in equally as different directions.

The Sixty-Seventh Congress has been something of a "freak" largely because of the overwhelming majority wielded therein by one of the parties. The Sixty-Eighth will be "freakish" because neither party has sufficient margin to insure the prevalence of its own will. No legislative body functions well if it is too securely in the control of one party, nor well if no party has control enough to enable it to see that at least something is done.

So it is not unlikely that the next Congress will be something of a "do-nothing" body, for the reason that no party and no group therein will be large enough to run things. There will be in it many groups sufficiently strong to keep almost anything from being done, and also to modify and color much that has to be done.

This is particularly true of the so-called Progressive group. It is going to wield great power in the next Congress because it commands enough strength from both parties as to make it neceessary that each party defer to it.

But that influence will be more negative than affirmative, for the reason, if no other, that the term "Progressive" has become little more than a word. It has gone the way of all coinages of political terms. In the conference of hand-picked Progressives of all parties, held in Washington shortly after the election, no effort was made to get together on any specific question. Two days of conferring and speechmaking resulted in a single agreement: that the President and Vice President should be elected by popular vote. If there were the least prospect of anything like that happening at any time soon, the conference would have gone to pieces on that. For what is the Progressive of Nevada, Iowa or Alabama going to think of that when he recalls that it will decrease his power in the premises from five to twenty times while increasing that of an immigrant on the New York east side and only one year removed from Europe not less than twenty times. Almost any subject to the fore would have disrupted the conference if it had undertaken to devise a program containing anything except generalities.

So the November election resulted in little more than the establishment of a political truce which will prevail at least until the Presidential election two years hence. Both parties and most of the Congressional groups and blocs will be engaged during the next two years in creating "thunder" for the great quadrennial political tug of war. They will do little else.

The prospect, therefore, is not very pleasing. There are many important problems the new Congress might settle. Even to a greater extent than did its predecessor it only will temporize with most of them, and thus may be productive of considerably more harm than good. That harm let us hope also will be of the temporary kind.

Is It the Referendum?

M'Cready Sykes, in a recent number of *Commerce and Finance*, voices an objection to the referendum as an overrated institution in American political life because it doesn't fit in with American political habits. He points out that not once in fifty times is there a full and intelligent vote on a constitutional amendment, but he also admits that it is not easy for the voter to find out what the amendment is about.

As we see it the trouble is not with the referendum but rather with the way in which the law is administered. The average intelligent voter is willing to use his best judgment in the consideration of such amendments if the political "powers that be" who have charge of the elections would only allow him to do so. When Mr. Average Voter goes to the polls down in our section he is handed a ballot about thirty inches long on which is printed the official list of names of the Democratic nominees for the various offices. There is no choice; no opposition; no need to exercise any intelligence—but wait, away down on the bottom of the ballot there appears some paragraphs in fine print. One of these reads:

"In favor of amending Article 6, Section 16 of the Constitution."

Another reads:

"Against amending Article 6, Section 16 of the Constitution."

Now Mr. Average Voter has a chance to be intelligent. He has before him an opportunity to show his critics that he is intelligent. If he has carefully memorized the Consti-

tuition of his State he will know what Section 16 of Article 6 is as it stands. But alas! Unless he has also carefully followed the mid-summer maunderings of the duly elected legislators of his State, during their annual assemblage at the capital, he has no possible clue to the amended phrases or what they are about.

A canvass of the political officials in any state or municipality will disclose the fact that the majority are lawyers. It is upon the shoulders of these gentlemen that the onus of ballot preparation in its purity and simplicity rests. It is upon their intelligence that the average voter relies and the success or failure of the referendum depends. As Mr. Sykes is a lawyer, perhaps he can tell us how, in the language of the street, "they get that way."

Cotton Goods in the Year 1922

In 1922 the raw cotton markets held on a price level above 16 cents for New York spots, and had almost reached 27 cents before the middle of December. The cloth markets did not go below a basis of 7⅛ cents for 38½-inch 64 x 60 print cloths, and had reached a basis of 10 cents when cotton was at its highest.

A short table of prices will show the extremes of the price movement in some staple cloths and in New York cotton, as follows:

			1921 Dec. 15	High	Low	Close Dec. 14
80 x 80	39″	4.00	12¼	14¼	9¾	14
72 x 76	39″	4.25	10½	12¾	9½	12½
68 x 72	39″	4.75	9⅝	11¼	8¼	11
64 x 60	38½″	5.35	8⅝	10	7⅛	10
64 x 60	27″	7.60	5¾	7¾	5½	7¾
48 x 48	36″	4.00	8⅞	11½	7¾	11¼
60 x 48	38½″	6.25	7½	9	6⅝	8⅞
N. Y. Spot Cotton			18.00	26.80	16.45	25.55

There were many unusual features during the year but on the whole the industry was profitable. The best proof of this is found in the wave of investment and mill building that is so clearly apparent in the southern field at the present time. This has not been the experience of the industry in other countries, however, for while mills here are running to full capacity, not more than 60 per cent of the spindles elsewhere are engaged.

The most extraordinary event in the year was the prolonged and bitter strike in some of the New England mills, beginning in the last week in January, and not being finally settled until just before Thanksgiving. Indeed, the situation today is that some of the mills that were engaged in the troubles have not yet resumed operations in full and are threatened with demands for still higher wages and shorter hours of work.

These strikes were so extensive that users of cloths were forced to look very largely to southern mills for their supplies and this brought about a sustained activity in the South among many cloth mills that would not have been seen, had the normal effects of general business depression been existing. The knit goods and the yarn mills did not do as well as the cloth mills, but the gains of the past four months have been sufficient to make many men forget what went before.

In addition to the great curtailment of production in knit goods and yarns, which reached at least 20 per cent of the capacity of the plants as a whole, and perhaps more, there was a restriction of production in New England mills, due to strikes, amounting to nearly 500,000,000 yards of all kinds of goods, principally ginghams, chambrays, worsteds, percales, bleached cottons, and napped fabrics. One concern alone, the big Amoskeag Company of New Hampshire, was compelled in the month of May to cancel orders for 35,000 cases of ginghams and several million yards of other cloths through inability to deliver while the mills were idle. As this company alone produces about 40 per cent of the ginghams that are used in the domestic market and was unable to produce a piece for months, the burden of supplying the markets fell on other mills, principally in the South.

As one of the consequences of this great labor struggle, the details of which are more or less familiar, one of the best managed mills in Lowell, Mass., the Appleton, recently gave notice of its intention to invest in the South where labor restrictions and legislative impediments do not throttle normal expansion, nor the power to exist as an industry. The Pacific mills, another large plant, is already preparing plans for the establishment in the South of a large bleachery that will take care of its already large output of gray cloths conducted in South Carolina. And other New England interests have concluded as a consequence of the year's troubles, to counsel no further extension of investments in New England until there has been a change of sentiment toward manufacturing properties.

Generally speaking, the cotton goods markets were poor in the first half of the year, but recovered in a very substantial way, beginning in August. There had been a great rise in cotton values in the fall of 1921 following the disclosure of a low cotton estimate by the government, and this led to large buying at rising prices by jobbers and converters.

The purchasing power of the country did not seem good enough to take care of the higher prices paid for goods and throughout the first half of the year the jobbers were obliged to liquidate their merchandise losses. This was true despite the very general curtailment of production referred to. Foreseeing a long hard period of merchandising at a close margin of profit, some of the larger mills and finishing plants made very low prices. While they secured business enough to keep their own plants running, their action set too hard a competitive pace for the general trade. Some of the large southern sheeting mills accepted export business on sheetings on a basis of 10 cents for 3-yard goods.

There seemed to be quite a revival of export demand in February and March, and some lines of colored cottons were sold to South America for the first time in 18 months. But despite this foreign aid, prices in general weakened, so that in the latter part of March and the early weeks of April, business was at a low ebb and prices were below the then current cost of production. For the first quarter of

the year events were wholly with the buyer, but many buyers could not operate owing to the slow distribution in their own territories.

In May there were signs of more stability to business, and while conditions were irregular in various lines, it seemed to be sensed that the cotton situation was going to change materially before the new crop came onto the markets. Many finished goods were reduced to the low parity to which gray goods and yarns had fallen, but it became evident that the worst of the year's liquidation and hesitation was over with. In June, the markets became steadier and higher and the course of the cotton markets began to be more clearly defined in an upward direction. The cotton rise continued well into July but there was a period at the end of that month when it fell back, and this led cloth buyers to be more cautious until the government reports came to hand.

The August government report on cotton, indicating a poorer condition than the trade was ready to believe, was at first discredited, but in a few days other factors of large importance began to make their influence felt. There were indications beyond question of a large farm yield, and there had been all through the summer a great boom in building. This building situation became better understood when merchants could forget the retarding influences of prolonged tariff legislation discussion, strikes on railroads and in coal regions, and muddled conditions in Europe.

Actual necessities for many kinds of goods wanted in manufacturing began to be seen in the orders that were being placed for heavy cloths of many kinds. The debacle that followed the collapse of the automobile supply orders after 1919 was overcome and there was a large call for many of the wide drills, twills, and other goods wanted in the rubber trades for auto tops and upholsteries. Then came the revelation that the cotton duck industry was overcoming the long inertia forced by the liquidation of war materials. Large manufacturing plants needed goods and the August government cotton report convinced buyers for these large users that it was safe to buy some part of their requirements to the end of the year at least.

From that time forward business in cotton goods began to gain and the rapid increase in prices was not only steady, but it represented large purchases for needs that seemed to be thoroughly legitimate and unavoidable. In September and October the buying became very broad and very active, several of the heavy goods mills being able to contract ahead into March and April of 1923. In November the buying lessened but prices as a whole held very steady. There was a constant rise in finished goods, merchants having been more anxious to move out their lines into distributing channels before meeting the full costs that were represented in the cotton advance.

The finishing plants had a poorer year than the fabric mills and the machine shops did not begin to get really active until well after the spring of the year. The earnings and dividends of the mills were maintained on a satisfactory level, as the contracts on hand when the year opened carried through for three months and the war time reserves were drawn on in some instances to maintain dividends. The fine goods end of the industry at no time did as well as the coarser end but the New Bedford mills, the center of fine goods production, paid an average of over 9 per cent to share holders in the mill properties.

B. R. Burnham, chairman of the Carding Division of the Southern Textile Association, who led the discussion at the meeting of that Division in Anniston, Ala., on December 8th, a full report of which begins on the following page. Mr. Burnham began his mill experience with the Empire Cotton Mills, Welland, Canada, and was next with the Stark Mills, Manchester, N. H., for about four years. Leaving there he went to the Jenckes Spinning Co., Pawtucket, R. I., and left that connection to become associated with John H. Meyer & Co., Inc., Newark, N. J., where he remained until July 1919, when he came South and located at Whitney, S. C., where he is now superintendent of the Whitney Manufacturing Co.

Toward the end of the year there was a financial development of large interest. Many mills began to issue stock dividends to increase their capital and get away from the danger of having reserves taxed for revenue purposes. In New England, the change is very marked as it has been the rule there to under-capitalize.

The outlook for the industry seems bright enough for the coming three months. The mills are comfortably well under order, some of the heavy goods mills being fully engaged through April and May. But cotton is a very uncertain factor for those mills not already covered. While prices for goods are high they do not offer a wide profit margin based on current costs of production. Possibilities of a further sharp advance in cotton are very numerous and if this happens, there is little thought that there can be a further successful advance in goods, that can be passed on to consumers. It is therefore a matter of serious concern with manufacturers whether a full production can be merchandised steadily until a new crop is harvested.

At the moment, farmers are beginning to get higher prices for the grains they hold. But the cost of living is high and textiles usually feel the restrictions of economy first.

Carding Section Meets at Anniston

An intensely interesting and helpful discussion of card room subjects, from the opening room to the finished roving, marked the meeting held by the Carders' Division of the Southern Textile Association at Anniston, Ala., on Friday, December 8th. The meeting was held at the Anniston Inn, and consisted of a morning session and an afternoon session, with the regular "Dutch" luncheon at 12:30 o'clock.

This was the first sectional meeting ever held by the Association west of the Carolina line, and the attendance was slightly under that of the average Carolina meeting. An initial reticence on the part of some of those present because of unfamiliarity with this type of meeting was quickly overcome by the excellent ability of the chairman, B. R. Burnham, in conducting the discussion. Mr. Burnham was recently appointed to the position of Chairman of the Carders' Section in the Association, succeeding Marshall Dilling, now chairman of the board of governors, and executed the duties of the chair in a commendable manner. Mr. Burnham is the superintendent of the Whitney Manufacturing Co., at Whitney, S. C.

The Morning Session

was opened at 10 o'clock with prayer by Robert W. Philip, associate editor of COTTON. Then Chairman Burnham announced that the order of the meeting had been changed somewhat over previous discussions, and that prepared papers on each of the divisions in the carding department would start the discussion on each section. "As it is impossible for one man's views to be forced on any number of men, particularly in the cotton mill business, it was thought better to shop these papers out." said Mr. Burnham.

The first paper, covering "Opening and Mixing," was prepared by L. R. Gilbert, superintendent of the Caraleigh Mills, at Raleigh, N. C., and, in Mr. Gilbert's absence, was read by R. W. Philip, who acted as secretary in the absence of A. B. Carter. The paper said in part:

"I shall endeavor to set forth as nearly as possible what I consider ideal conditions in the selecting, mixing, preparing and opening of cotton. You would be surprised, were you to investigate, at just how many superintendents and carders are running cotton that *they have been told* has the staple and grade.

"Some cotton salesmen who are experts both as salesmen and cotton men—with the emphasis on the salesmanship—gain the absolute confidence of the executive who buys the cotton, and when he receives the order for say a hundred bales of strict middling 1 to 1 1/16-inch cotton, he is just a little more apt to send to the mill a conglomeration of grades and staples than he is to send just what was ordered. I believe the rules of the Cotton Exchange permit a certain amount of that, but if you are running a card room or a cotton mill and 1 to 1 1/16-inch strict middling runs best—and certainly you ought to know better than anyone else—you want 1 to 1 1/16-inch strict middling cotton.

"Now if you personally do not, or do not have a man of your own who does, staple and grade every bale of cotton that you put in your mill, throwing out the bales that are too far off grade and staple, you are going to have a job that will run by spells or waves; sometimes it will run and sometimes it won't. Right here I wish to say that I do not at all blame the cotton man, for I have yet to see the one who would not give you what you wanted if you refused to take anything else. Therefore, so far as I can see, it is entirely up to us.

"Also, I wish to absolve from all blame the executive who buys cotton, for I have yet to see one who, if you were able to show him a bale of cotton that was off grade, wouldn't support you in your contention. Therefore, I shall point out as the ideal condition: the organization that with deliberate premeditation believes with its whole heart and soul individually and collectively that all cotton is off grade until it is shown otherwise.

"At our plant, which is only of medium size, I personally staple and grade every bale of cotton that goes into our warehouse. I haven't been doing this many years, but I happen to know that it has meant a great saving each year in good running work and increased production.

"Relative to the mixing and opening of cotton, I shall give you a simple statement of what we are doing; I feel I am better fitted to write about the methods which we are pursuing than to theorize on the supposed methods of someone else.

"We are dyeing and bleaching all of our work in the raw stock, making dress ginghams. As you know, it is essential that you get ageing and mixing to successfully handle cotton dyed in the raw stock.

"We have in an opener room, which is a part of our cotton warehouse, a bale breaker, onto the apron of which is fed thin strips of cotton from an opening of 15 bales. This cotton is drawn through a pipe condenser about 150 feet away, to the raw stock dyehouse, where 1,000 pounds is put into a dyetub and, we will say for example, dyed dark blue. This is dyed, dried and blown through a fan into a fireproof room in what is usually called an opener room, in which are found a number of fireproof bins and our automatic feeders and vertical openers from which our stock is drawn through condensers to the breaker on the floor above. Tomorrow or next day we will dye two more bales dark blue and blow into the room on top of the two bales already in the room, and a day or so later we will do the same thing; the rooms in our case hold six bales. There we have six bales of cotton that have come out of a perfect mixing of 45 bales, and have been torn up on the bale breaker, further opened in being drawn through the pipe to the condenser in the dyehouse, and given a most thorough opening when drawn through the fan which blows it into the fireproof bins in the opener room. When we need a color we take it from one of these bins, where it has either gained its natural moisture or lost any excess of moisture it might have had, thereby giving us a stock that is as near the ideal condition for proper handling and even work as we have been able to obtain.

"The further opening process that we have is not quite as elaborate and efficient as we think we need. When we put our present system into operation we ran our raw stock through an automatic feeder into a vertical opener from which it was drawn to an automatically regulated feeder on the breaker lapper on the floor above. Some time ago—

to be exact, about the middle of June this year—we decided to put an old No. 7, Kitson opener, which has a Buckley beater in it, between the automatic feeder and the vertical opener. After doing this we found that our breaker lapper, which was fed by this set of machines, was taking out less than half as much waste as it had been doing; but we found that the opening machines— that is, the No. 7 opener and the vertical opener placed in tandem—were taking out enough more than the vertical opener alone had been taking out to make up for what the breaker lapper was losing in percentage of waste. There was no change in the waste from the finisher lapper.

"Following are some figures that will show more clearly just what I mean:

WASTE FROM THE DIFFERENT MACHINES EACH WEEK SHOWN IN POUNDS.

Side No. 1-Bleached				Side No. 2-Colored		
No. 7 Opener	Vertical Opener	Breaker Lapper	Finisher	Vertical Opener	Breaker Lapper	Finisher
13	28	11	29	19	27	26
11	24	9	20	16	23	22
14	32	15	28	25	31	27
15	21	11	21	20	28	23
10	24	13	22	20	21	26
15	25	13	24	24	26	25

"We would gather from this that the point brought out in the very able paper of Mr. Brown of the Clifton Manufacturing Company at our last meeting in Greenville is correct—that is that much good was derived from taking as much of the trash out of the cotton as possible in the opening processes, because if left for the beater on the breaker lapper to knock out there would be a great deal of broken leaf that would find its way into the finished yarn.

"Our work is not cleaned as we believe it possible to clean it; we believe that with three or more vertical openers in tandem our work will be much cleaner, and we expect to eventually put them in."

Following the reading of Mr. Gilbert's paper, Fred O. Tyler, secretary, Anniston Mfg. Company, asked, "Why should he dye all his motes; would it not be better to run it through a vertical opener beforehand, to get all the foreign matter possible out before dyeing?"

W. P. Hazelwood, manager, Adelaide Mills, replied by saying, "It seems to me that the dye would have a tendency to eat much of the dirt." Asked for a statement in this connection, J. O. Edwards, general overseer of carding, Lancaster, S. C., said, "I have had some experience along dyeing lines; I was for nine years connected with a denim mill, and we always dyed our raw stock after it had gone through the bale breaker, and I think Mr. Hazelwood's idea about the dye eating up the foreign matter would have something to do with it. I know I noticed there was always less foreign matter in the dyed cotton than there was in the white cotton. I had not thought about it in that way, but this question of why not clean it first presents an opportunity for some discussion.'

J. T. Edmunds, overseer of spinning at the Pell City Mfg. Co., said that he is now at the mill referred to by Mr. Edwards, and "our system is to select the best, cleanest grades of cotton in our warehouse for the purpose of dyeing. If we have any good cotton we take that out to be dyed in the raw stock, and I think that may be the reason that there is less leaf showing up in the cotton on the different processes all along the line. However, I cannot say whether the acids in the dyestuffs would have any effect on the leaf and foreign matter, but I do know that we use our best cotton for the purpose of dyeing."

Touching on this subject, Chairman Burnham said, "I suppose that the processes necessary to clean cotton before the dyeing was done, were more or less injurious to the cotton back in the old days, but now since the vertical openers have come into use, and since they have been hooked up in tandem, I do not see any reason—except that local conditions at the plant may make it necessary to do otherwise—why we should not put the cotton through two or three vertical openers before it is dyed."

Next, taking up the question of grades of cotton, Mr. Burnham opened the discussion by saying, "Mr. Gilbert, in his paper, states that we should get what we want to run, but the trouble I have found is that the cotton is accepted and is in the warehouse before anything is done, and then the poor superintendent 'picks the buck.' Mr. Gilbert makes the statement that the further opening process he has is not quite as elaborate and efficient as he would like to have." He then opened the meeting for the discussion of opening equipment.

"Right along that line," responded Mr. Edwards, "I want to give the idea of what we have at Lancaster. We have one room in which we open 190 bales, and lay the cotton out on the floor around the walls. Then we have another room where we open up 60 bales. We have trucks to haul the cotton from the pile to the openers, and we place four of these behind the automatic feeders and feed from the boxes into the hoppers, and we feed from one pile one day, and from another pile the next day until we get back into the same room about every three or four days. Since we put that system in we have been able to get better numbers and use a lower grade of cotton. We get a better mix—50 to 60 bales at a time—and we use low middling to good middling, mixed together in the mix.

"Mr. Gilbert spoke of the grades and staple. We have ⅞ to 1 1/16 inch and get along all right."

"What is your average length?" asked Mr. Hazelwood. "We put down two bales of good middling and low middling and then a middle bale of strict middling. The staple will average a middling. We try to get 1-inch to 1 1/16-inch," was Mr. Edwards' reply.

"What do you consider the proportion of staple cotton and short cotton that comes to the bale. If you staple 1-inch cotton what proportion is going to be that and what will be the amount under that?" was next asked by Mr. Hazelwood. "It would appear to me that it would be around 60 to 70 per cent," was the reply.

"Have you found that the government grades come up to specifications?" was the next question. "Government grades are a little short," said Mr. Edwards. "The government grade of 1-inch will be what we call a 'flat inch.' "

Otto Latsch, manager of the Southern Mills Corporation, Oxford, Ala., asked Mr. Edwards for his variation in numbers. The reply was that it ran, on 30s, from 28s to 31s. "I would like to ask a mill using from 10 to 15 bales a day," continued Mr. Latsch. "I use 25 bales a day," said

Mr. Hazlewood, "and I do not think my numbers vary any more than that."

"We use around 20 bales a day," added Mr. Burnham, "and as nearly as I can remember, it is about the same thing on 30s as Mr. Edwards." Referring to the proportions of staple cotton in the bale, Mr. Burnham continued: "I believe the Bureau of Standards gives that as 80 per cent."

"Right now," said Mr. Edwards, continuing this discussion, "we have over 10,000 bales of cotton, government 1-inch. Last week I noticed my frames were running 'tough,' and when the stuff got to the spinning frames there were laps around the rolls. We went down into the opening room and pulled the staple of the cotton and found it to be what is known as a 'flat inch.' It was breaking between the middle and back rolls. Next day, however, it rained, and everything got all right."

"You make the statement that you are running 'flat inch' cotton and 1 1/16 inch in the same mixing. How does it run?' suggested Mr. Burnham. "It runs very well," Mr. Edwards said, "because, perhaps, of the good mixing that we put it through." The percentage of 1 1/16-inch is about 50 per cent, he added in response to a question.

The Use of Vertical Openers.

The next question presented to the meeting by the chairman for discussion was the use of vertical or Crighton openers in the cleaning and aerating of the cotton in the opening process. "The claim that is made for these machines," said the chairman in starting the discussion, "is that with them you can remove that heavier foreign matter and some leaf at this process without injuring the fiber of the cotton and that an extra process of vertical openers will not hurt the cotton." He asked for a show of hands from those who were using this type of machine, and four or five indicated that they were using it.

"We haven't got any yet," said Mr. Hazelwood, "but we have some ordered. Our average number is around 16s to 18s, and we have concluded that we would get some vertical openers and try to improve our work in order to compete with other yarns."

Experiences with this character of machine were asked for, and E. F. Brown, superintendent, Clifton Mfg. Co., Mill No. 3, at Converse, S. C., responded, "We have been running our vertical openers since about the 15th of July—three in tandem—and for about six or seven weeks we ran them with the perforated screen, and then we put in the grid bars. We did not take out as much short staple with the screen as we did with the bars. We ran the machines with the grid bars half open, and out of 7,000 pounds, or about 17 bales, we are taking out about 3½ per cent short lint, dirt, foreign matter, etc. We run it through into a Morton distributor and distribute it into the hoppers that we always have had, and we have done away with the intermediate pickers and are getting as good and as even a lap on the breaker as we did on the intermediate, and an excellent lap from the finisher." He answered a question in regard to speeds, saying that the first vertical opener in the line was run 700 r. p. m., the second, 600 r. p. m., and the third, 500 r. p. m.

"What about our opening?" prompted Chairman Burnham. "Is everybody here satisfied with his opening? We would like to hear from somebody making yarns coarser than 30s."

Mr. Tyler stated that he is going to install two vertical openers in the place of some existing equipment.

The next speaker was J. D. Loner, superintendent of the Dwight Manufacturing Company, at Alabama City, Ala. Mr. Loner, in the course of his remarks, described a new device for use on the picker in eliminating black specks from the cloth.

"Just for the sake of what might be a little information," he said, "our average numbers range around 14s, and we have two systems of opening. There are two sections in our opening room, which is large, and we have one mixing from one side and then one from the other side. We take 18 bales of cotton, spread it out on the floor behind three or four Saco-Lowell bale openers, and that cotton is fed off the different bales systematically into these openers. On the apron of the first machine we put what waste is returned to the opener room, which gives us an even mix of the waste. From that the cotton is carried up through the regular system of the Morton distributor and is distributed along on one side of eight openers. Taking this cotton from the 18 bales, when it drops into each one of these machines in turn, of course we are getting some of that cotton into the regular mix. The Morton distributor feeds into the hoppers alternately as you know.

"If any of you gentlemen happen to have that kind of a system, you have doubtless had the experience that we have had about leaf and specks in your cloth. We find that this shakes out a great deal of what we call 'smoking tobacco.' In some mills I find that the slats on the apron that comes with these machines is closed up. Some mills are opening these to the width of a lead pencil, and when this cotton falls down it shakes out dirt.

"The point I am trying to make is this: The Dwight Manufacturing Company at Alabama City is connected with the Dwight Manufacturing Company at Chicopee Falls, Mass. A man in that mill has gotten up a new system for cleaning on the pickers and we have had it put in at our mill at Alabama City.

"During the last two or three years we have had more trouble and experienced more complaints on the quantity of specks in the cloth than we have had since I have been with the mill, and we have, by putting in this system, succeeding in reducing it. Where we were using strict middling cotton, we have cut the strict middling cotton down to 40 per cent and are using 60 per cent middling cotton, and making a cleaner cloth. In a plant of any size the difference between strict middling and middling cotton amounts to a good many dollars."

"Of course this system has nothing to do with off-color. If cotton is middling because of its being off-color, or by stains and tinges, it will not alter the color, but my experience has been that a great deal of cotton is called middling because it carries so much trash with it.

"I will try to explain this device as best I can, but if any of you men are interested in looking it over you can understand it better than I can tell you, and if any of you will come to Alabama City I will be glad to show it to you.

"On the picker this man put in an extra draft. I am not a carder, but you men will know what I am driving at. In feeding the cotton into the picker and knocking it off, with one draft pulling in one certain way, this leaf is lighter

than the fiber, and the draft necessary to carry the cotton along will also carry the fine black leaf along with it, and after it gets by it gets broken up.

"I have never seen anybody who could get rid of it, but this man went in there and in the bottom of the picker, underneath the beater, he brings up a separate partition, and puts in a different draft to pull in the opposite direction, and where your solid plate is in the bottom of the beater cage, he takes it out and puts in a wire screen, and when this cotton is knocked off by the beater it goes over the grid bars, and when it strikes this screen it strikes a dead air space, and the leaf falls through this screen. I will say that it is wonderful the amount of stuff that is taken out from under these pickers."

Mr. Loner continued, saying that in these pickers they had in a standard make of grid bars, and that the makers of the attachment wanted to use their own grid bars that were set one inch apart. He said that they had found, however, by taking out a few of those already being used, that the proposition worked very nicely.

Another thing, he pointed out, was that the matter taken out by this device was none of it workable. "I guess every carder here knows how he has been ridden by his superintendent when he takes out motes that are too 'fat.' But with this system the motes on the finishers and the intermediates and on back to the breaker are absolutely worthless, and I think on about 60 machines our boss carder has had to have two men to clean the machines out, whereas the picker man used to clean them out every morning. This project is new, and I guess the Dwight Manufacturing Company at Alabama City is the only one in the South that has one. The results are wonderful, and I just merely mentioned it because I thought it might be of interest to some of you men.

"There was something said about grading cotton a while ago. We have a regular cotton man, and we always insist on 1-inch cotton. We don't always get it, but he grades every bale that comes in the mill, and makes a record of it. If it is over an inch he marks it, and if it is under an inch he does likewise. He grades something like 25,000 bales a year, and there is more staple under length than there is over—that's our experience."

"Wonder where our North Carolina men are who said they were having trouble with specks in the goods," asked Mr. Burnham. "Let me ask you one question," he requested Mr. Loner in connection with the machine which the latter had just described. "Do you find that the screens on your pickers are giving as good results now as before? Is there any effect on the lap?"

"Our boss carder is here and he can give you more information on that than I can," replied Mr. Loner. "I think he has made the statement that he doesn't get what he thinks is as even a lap with the two drafts as he got with the one. The drafts, though, have got to be just about right. If one gets too much it will make an uneven lap, but so far as the running of the mill work is concerned, that has improved. So far as variation in numbers is concerned, I think it is doing just as well if not better."

Called upon for a statement in connection with this device, B. S. Turner, overseer of carding at the Dwight mill at Alabama City, said, "I have been fooling with this for some five or six months, and there is a lot of trouble in making an even lap. It is not uneven with a thick place here and a thin place next, but it wants to go through either too much on one side or too much in the center. But I have about overcome that. I think it is a great thing to take out the little specks and fine leaf that shows upon the face of the cloth that I have never been able to get out at the card—and I have never seen anyone who has been able to get it out.

"This draft is underneath the picker, and pulls through this screen. It is one draft bucking another draft. This draft is directly underneath the beater, pulling through one-eighth inch mesh wire. You cannot pull any cotton through that amounts to anything; you cannot get the cotton, but it pulls that little fine leaf right through and you can take it out in wheel barrows full. The place it falls into is not very big—there is a partition across the picker 40 inches long and about 4 inches wide from the floor up to within eight inches of the beater, and it will fill that up with dirt and trash twice a day. It takes out a wonderful amount of leaf that you cannot take out anywhere else."

"While we are on this subject," said the chairman, "let me ask the men here who have vertical openers: what amount of the small leaf does your vertical opener take out?"

Mr. Brown of Converse responded to this. "I cannot say just what amount it takes out, but it's a whole lot—it looks like smoking tobacco, as that gentleman says."

"That's been our experience," added Chairman Burnham, "that a whole lot is taken out with the vertical opener."

"This process," he continued, "has a lot of merit, and that is why we get together in meetings like this: to learn just these things. If any one is in trouble it will pay them to look into this arrangement.

"The reason I asked about running 30s and under was that a few years ago there was an idea prevalent that to get even work you had to run cotton into a room and let it age. Now I'm going to outline a lay-out to you that I hope will start some discussion, and I would like very much to get your ideas on it: No. 4 bale breaker, Saco-Lowell, Crighton-English type-vertical opener—from there through a conductor pipe to the Morton distributor, from the Morton distributor into automatic feeders connected to the breaker pickers. Feeding from an opening of ten bales. That would have been thought impossible ten years ago. One thing I forgot to mention: all the ties are taken off the cotton a day before it is put on the feed aprons of the bale breaker."

"Is it compressed?" somebody asked.

"Some of it is, yes sir," Mr. Burnham replied. Sometimes, he continued in response to a query, as much as five bales out of the lot is compressed. He also stated that the two cottons run together all right. In the lay-out described, there is a Kirschner beater in the finisher picker, with blade beaters in the breaker and intermediate.

Mr. Tyler at this point explained that in the ageing of cotton, one of the great benefits is allowing the cotton to straighten itself out, so that when the fibers come in contact with the beater the short fibers will be thrown out. "Is that necessary on uncompressed cotton," asked Mr. Hazelwood, "to let the cotton age? My experience has been that it doesn't gain you anything on uncompressed cotton. I have tried it and cannot see that we got any better results."

"You get a uniform humidity in the cotton," said Mr. Tyler.

"Speaking of cotton," suggested S. H. Harris, of the Standard-Coosa-Thatcher Company, Piedmont, Alabama, "if anyone is running strict middling, I would appreciate hearing some discussion on numbers and also as to the number of beaters used, type, etc., for 1⅛ to 1¼ inch, strict good middling cotton."

When the chairman asked for discussion on this subject, Walter Smith, overseer of carding at the Standard-Coosa-Thatcher Co., Piedmont, Ala., gave the arrangement of opening there. "We run 1⅛, 1¼ and 1 5/16-inch cotton. We went off from the short onto the long. We use a bale breaker. Our opening room is not as large as we would like to have it. We open 12 bales and have a man go through and sample every bale.

"We have different kinds of machinery in our picker room, some Woonsocket, some Atherton and some Pettee. Some have three blade beaters, some two blade beaters, but we do not have any intermediates. We have to make a very even yarn; all our yarn is for the knitting mills. We run from 30s to 70s; our average number is around 48s.

"In the picker room we are very particular. We make 360 laps a day of ten hours, and set back about 15 laps a day. The variation we allow is a quarter of a pound each way, and we get a pretty even yarn."

The chairman asked Mr. Smith how long the cotton is opened before it is put into the opener. "I am sorry to say that we mix it up every day. We have one bale breaker and mix 12 bales, working about 36 bales a day, and we are going to put in another bale breaker."

Mr. Burnham then inquired if the cotton is allowed to stop anywhere along the line of process. No, said Mr. Smith, this cotton doesn't age over a day or night. They use compressed bales, he said.

"That would be very unusual—to run it straight through," said Mr. Burnham, and asked the variation.

"The percentage of variation is very low," responded Mr. Harris, "ten per cent in the laps. The yarn will not vary more than five per cent either way. We are figuring on a new lay-out where we will take 43 bales and let them set over all night on the floor and then put it through the next time and run it into two bins which will hold 20 or 30 bales, and keep them full and use out of them. That will give it a day and a half on the floor."

"Do you sample it more than once?" asked Mr. Hazelwood. "Yes sir," was the reply. "Do you find many bales that vary?" was the next question. Out of about 8,000 or 9,000 bales, was the reply, they would throw out about 70 bales as bad cotton.

At this point, David Clark, of Charlotte, said, in reference to the variation in numbers, "I just want to recall that there is no such thing as five per cent variation in yarn numbers. The spinners have gone into this matter thoroughly by taking the whole side of 208 spindles and testing every bobbin at the same time. There has been nobody yet who has found a variation of less than five numbers; most of them are nearer ten numbers."

When called upon in this connection, Mr. Few. of the Profile Cotton Mills, Jacksonville, Ala., stated that his numbers varied about four numbers on the whole of a spinning frame.

"I think it will surprise you," continued Mr. Clark, "if you will make this test, and test the bobbins all under the same condition."

In regard to opening, continued Mr. Clark, "I want to call your attention to the conditions in England. If you will get the English year book you will find that there is not a mill in England that uses double roving under 40s yarn. It is almost unknown in England to use double roving on 40s and under." The Englishman's secret, declared Mr. Clark, is that he thoroughly prepares the cotton before putting it into the pickers.

A member asked Mr. Clark, if in the experiments in the Carolinas, any of the men reporting were making as low as 9s. Mr. Clark said he didn't recall any lower than 14s.

Mr. Burnham declared that he was one of the Carolina men who had been disillusioned on this question of variation in numbers. "I made a test when I went home from one of the discussion meetings, on 14s filling," he said, "and as well as I can remember, I found it as light as 16s and as heavy as 13½s on the same side of a frame. I didn't believe it before I did it." He added that in his opinion some of the men present would probably not believe it, but if they went home and tested it, they would soon learn different. He stated that it was his opinion that a good deal of the trouble lay in full and empty bobbins of speeder roving from the intermediates.

Mr. Brown's Paper on Picking.

The chairman then presented E. F. Brown, of Converse, S. C., who read a paper on the subject of picking. In beginning the paper, Mr. Brown said, "I would like to review the picker room as I knew it thirty years ago. In those days, when the carder got the cotton rolled up into the shape of a lap and the lap held together he thought he was doing fine. In the first picker room I ever worked in, the cotton was spread by hand on the apron of the breaker, this machine had one porcupine beater and three two-blade beaters, all making 1,500 r. p. m., and the only reason we didn't run them faster was because of bearing trouble.

"Each day we would take from under each beater a large hamper basket of motes and carry them to the mote pen where they remained until rotten. I must say, however, that these rotten motes did make fine fertilizer. It is only in recent years that we have come to the point of weighing laps in the picker room. Some of you old-timers will remember the trouble we had trying to keep even numbers on the railway heads.

"But today, with a properly equipped picker room, it is very seldom that the card room is called upon to change gears.

"Five months ago we installed at our mill, vertical openers in tandem and automatic distributors for the breakers, and cut out the intermediate pickers. The results have been wonderful. Since the installation of this system we haven't had a single fire, neither have we had a choked picker. Our breaker laps are now as even as the intermediate laps were before. Our finisher laps are so even that we have to set back very few."

At this point Mr. Brown read extracts from the paper of L. L. Brown, superintendent of the Clifton Mfg. Co., in which further details were given concerning the results and advantages effected through the use of this installation at the Clifton mill. This paper may be found complete upon reading page 14 of the November number of COTTON, in the

report of the semi-annual meeting at Greenville, S. C., before which this paper was presented. At the conclusion of the paper Mr. Brown had read a letter from another mill that had installed vertical openers, Buckley cylinders, evener arrangement, and feed regulators, cutting out the intermediate picking process, which stated that after this installation it was necessary to take out twist on slubbers, intermediates, speeders and spinning frames.

Mr. Cordle of the Indian Head Mills of Alabama, asked Mr. Brown in connection with his picking arrangement, "How many beaters do you have?" and the reply was "one two-blade in the breaker and a Kirschner beater in the finisher."

Referring to the waste made, Mr. Loner said, "Our carder made some tests from the bale of cotton to the finished lap, and found a loss of six per cent."

Mr. Cordle asked, with reference to the letter included in the paper of Mr. Brown, "Why does he think he had to take out the twist on the slubbers, speeders, etc?" Mr. Brown explained that this was quoted from a letter received from another mill making hosiery yarns, and then the chairman asked, "Well, what is the answer? Why could he take out twist, Mr. Edwards?"

"The only answer I can give," responded Mr. Edwards, "is that with the better build of the cotton you can take out the twist. This is caused by the fact that we put in twist only to keep the strand from pulling apart. If you have any foreign matter in the cotton it is necessary to run more twist, as the only reason that we put in twist is to make it hold together."

"I would like to make a little statement," requested Mr. Brown, "Last month we had all of our vertical opener waste returned and ran it through a mote machine, and we had four common size bales, and out of that we got 21 laps that were used in the making of osnaburgs."

"That brings us back to the old question of how much fiber we should take out," said Mr. Burnham. "The amount of waste on middling cotton, from my own experience, putting it through the No. 4 bale breaker, Crighton opener, breakers, intermediates and finishers, is around 6½ per cent."

"We get 6.10 per cent," added Mr. Loner.

"Some of that was put in on account of color, and some more on account of trash and dirt," continued Mr. Burnham.

The Length of Picker Laps.

Changing the discussion at this point, the chairman said, "At one of our carders' meetings, the question came up of the length of laps from the finisher picker. Several carders said that is made by having a certain gear on the knock-off motion, and they were asked to go home and check up on that. In reporting their findings, it was shown that a lap that was supposed to measure 48¾ yards, and instead of that they were getting them from 42 to 52 yards long. On the 55-yard lap the same thing was found. Those fellows came back and reported that, but before you couldn't have made them believe that there was any such condition in their mill.

"But they were paying no attention to the length of the lap. It was hard for me to believe that until I went home and found that mine were just about as bad as the other fellows'.

"In my estimation, this is one place to get a whole lot unevenness out of the work. We fuss and fume about a ½ pound on each lap and say nothing at all about five or six yards in length. Has anybody here measured the laps from the finisher picker?"

"I have," said Mr. Hazelwood, "and we found practically the same condition that you speak of. I think that the friction on the brake shoe has something to do with it. We checked up on all our gears to be sure they were right, and then we still found a variation in the length."

Mr. Edwards next spoke in this connection. "On our machines," he said, "we are supposed to make a 45-yard lap. But we found our laps ranging from 45 to 48 and 50 yards long, down to 43 yards. That condition is caused largely by the friction on the brake shoe, as the gentleman suggested. If you will scrape it off it will do better; when it gets tight it doesn't let off as it should. That head should be let off gradually, but when the head gets tight and jams, that causes the lap to stretch, and the lap is about three or four yards longer than it ought to be."

Mr. Edwards stated that there is always a stretch in the lap which will amount to around seven per cent, owing to the friction. "Where you find a head working properly you will find about seven or eight per cent. I attribute all the unevenness in this connection to the friction on the lap."

When asked about the use of ball bearings at this point for the elimination of friction, Mr. Edwards replied that he was not familiar with this adaptation.

"I have been in the same boat," added Mr. Smith. "We have five finishers and our laps are supposed to weigh 50 pounds. We took a lap and rolled it out and had ten weighings of the lap—a 12-ounce lap—and we measured it and there were four yards difference in the length, but we finally got it straightened out."

H. B. Miller, superintendent, Ashcraft Cotton Mills, Florence, Ala., was asked for an opinion, and he said that sometimes the troubles was in the 13- or 14-tooth gear that is used on the feed shaft. "When you get home you look at that gear," he advised the men.

In this connection, Mr. Burnham pointed out the necessity for a careful and exacting inspection. Around a cotton mill, he said, one of the self-evident truths is that a man can find a difficulty in a process, take steps to remedy it, and get it running all right, and then return to it after some time and find that he is right back where he started. "Once every week," he continued, "our finishers are checked over, and our intermediates are checked over, and if we find a knock-off gear that is supposed to be turning out a 48¾-yard lap and is not doing it, then we stay right with that machine until we get it to running properly."

In reply to questions as to his method of "getting it to run properly," Mr. Burnham replied emphasizing the necessity of scraping the friction and keeping it in good shape so that all foreign matter is removed from that. He pointed out that sometimes belt dressing is used on it and should be cleaned off. Yes, said several in the audience, and sometimes Spanish whiting, and even Octagon soap. Answering a query as to how it could be cleaned, Mr. Burnham indicated that it can be cleaned effectively with gasoline, "if you can get it by your insurance inspectors."

One member asked, "well, what would make the lap get shorter?" and another inquired if there was any measuring device which could be applied for the measuring of these rolls.

Referring back to the causes of a lengthened lap, one member suggested, "What about a tight roll in the lap rack?" "Yes, that would be another place," said the chairman.

"By the way," the chairman continued, "I have seen an Alemite automobile gun used where there is a hollow brass bushing, and it does mighty fine business, and lubricates it well."

The next question brought up was "What do you consider a reasonable variation for the lap? When do you think you have done all right?"

Mr. Edwards was the first to reply to this question. "I had a test made about a year ago on the variation in yardage," he said. "We run an 11-ounce lap, and weighing five yards at a time—because this was much more convenient—we found that the variation in those five-yard weighings would run from ½ to sometimes ¾ of an ounce either way from the standard weight of 11 ounces. You know all pickers will make a smooth lap for a little way and then run a light weight and a heavy weight. What causes the picker to make an uneven lap? I would like to have somebody explain what causes that variation."

"Too much slippage on the lattice feed table," was suggested.

"Well," argued Mr. Edwards, "we had a positive drive with no slippage on the aprons, but still we had the variation in the yardage."

Mr. Cordle suggested that this was caused by the fact that the evener motion doesn't work until it is too late—that is, the thick or the thin place causes the evener to work, but the uneven place slips through before the evener's action takes effect.

"You once ran the carding at the Exposition Mills under Stoney Drake, didn't you?" Mr. Cordle asked Mr. Miller. "Didn't Mr. Drake require that all the lappers be set so that with one off it would make the same?" Mr. Miller replied that he couldn't say that that was so effective, until they set the fulcrum properly.

J. E. Carter, of Jacksonville, Ala., suggested that Mr. Loner explain the attachment used on his pickers. In explaining this, Mr. Loner stated that "this is nothing more than a piece of casting bolted to the frame which lets the bottom cone just swing in such a way so you have no slack evener belt. It just takes it up, and keeps some tension on the evener belt. Our carder likes it very much."

"That applies the same principle that is used on the floating cone on the fly frame," said the chairman. "But I'll tell you, I think these things are used to cover up a multitude of sins—and I would not say that unless I had made a thorough investigation of pickers about this unevenness in variation per yard.

"We found that we were getting a great variation per yard. We had positive driven aprons and tightened the cone belt and tried to run it with three laps on it, and we found that we couldn't do it very well, and I went back and found what we should have located at first. The quadrant that moves the rack to change the position of the cone belt on the cone is a little shaft working in bearings that in our case were worn out. The bearing was no good when it was put in and running it for about 30 years didn't improve its condition any. We had it overhauled to make it sensitive; there are two or three devices that you can put in there to make it sensitive. Before we overhauled it, it wasn't sensitive.

"Someone said a while ago that the thick places would have to come through before the evener changes. It will be more sensitive if that quadrant on the quadrant shaft, all the bearings of the two top cones and the bottom cone are put in good condition. You want to understand that if a bit of friction is thrown on the cone belt it gives it a tendency to slip and if it does slip it is giving you uneven work.

"This hanging cone is a mighty good one, but the first thing you want to do is to remove all the friction that you can from the evener belt. There are ball bearings made for both ends of this cone and with ball bearings on the bottom evener and the proper adjustment and care of the quadrant shaft, you are going to get as good results as you would have with the hanging cone.

"Are there any more experiences?"

Mr. Harris declared that his opinion was that the type of machine had considerable to do with it. He said that they had never succeeded in running three or five laps on one type of machine but that on another make of machine he had been very successful. He said he is now using an old type machine with vertical cone. In explaining his method of testing, he said, "We roll the laps out on the floor so that they are spread out good and we take a yard rag and take 20 cuttings out of a lap and test them. Our variation was 2.1 per cent average per yard."

Here Chairman Burnham said, "I heard a fellow make a statement that the pound or pound and a half or two pounds on a 14-ounce lap would be lost in the machines in the processes of drawing, slubbing, intermediates, speeders, etc.—that these machines would give you more variation in your yarn or as much as a pound or two pounds would give you on the lap. Why fuss about a pound or a pound and a half when your work in the remainder of the mill will give you more waste than that will?"

"On your 14-ounce lap," asked Mr. Burnham, "with a pound heavy or light, have you figured what that would do to you in the spinning on 20s yarn?"

"Suppose you are 10 per cent wrong to start with and get another 10 per cent in the other processes, where are you when you get to the spinning room?" commented Mr. Smith.

"A man told me once," recalled Mr. Edwards, "when I went to his mill as carder, that the man who was there before me had the best numbers of anyone he knew. He said the finisher man would go along to weigh his laps and sometimes he would and sometimes he wouldn't—he would often go a half a day without weighing them—and the superintendent told me that that man had the best numbers he had ever seen." "Maybe he was a good guesser," was the comment heard.

Chairman Burnham then stated that the meeting would go into a discussion of beater speeds and "fan speeds if anyone cares to. We will take this up methodically and in order to get started, suppose we take the two-blade beater in the breaker picker. How many are running between 1,000 and 1,200 r. p. m.?" Three indicated that they were running at this speed. No one indicated a speed between 1,200 and 1,300. Two were running this beater between 1,300 and 1,350; no one between 1,350 and 1,400;

and one said he was running between 1,400 and 1,500, who said he was running 1,485. "We find," he explained, "that we get better cleaning with that speed. A three-blade beater we run a little less. We get out more motes with the higher speed." No others indicated the speeds they used.

"Have you tested it for breaking strength?" asked the chairman, referring to the product of the 1,485 r. p. m. beater.

"Our yarn is for hosiery mill use, and breaking strength is not so essential as cleanliness," was the reply, "although we did test some yarns for warp and they broke standard."

Going onto the intermediate picker with regard to speeds of beaters, one man indicated the use of a speed between 1,100 and 1,200 r. p. m.; one between 1,200 and 1,250; one a speed of 1,325 r. p. m., saying he had it at 1,500 and cut it down.

On the Kirschner beater in the finisher, one man said he ran this at 950 r. p. m., two between 950 and 1,050, and one man faster than 1,050, who said his speed was about 1,173, making hosiery yarns, 24s to 32s.

Mr. Burnham asked if anyone had any data on beats per inch. "Speaking of beats per inch," replied Mr. Edwards, "I had a little thing sprung on me the other day that has put me to thinking about it. A young man at the mill said to me, 'You are always talking about the beats per inch; did you ever think about the beats per ounce?' Just think about that: you feed a heavier lap through and you of course are putting more ounces through.

"Our beats per inch are about 24 on the breakers, 45 on the intermediates, and around 58 on our finishers, and we have a breaking strength that is not up to standard. I have made different tests on breaking strength with different speeds and different settings. I read an article some time ago about a man who ran two processes of picking and made a lap every 20 minutes, getting 110 beats to the inch. He claimed he got 62 pounds breaking strength on 30s yarn. That was something new to me, so I tried it, and the first weighing I got—using two processes with the Kirschner beater at 100 beats to the inch—the breaking strength ran from 58 to 62 pounds, but there was not a time after that for about three months that we got over 55 pounds, but it does give very good breaking strength."

(EDITOR'S NOTE—The article which prompted Mr. Edward's experiments in this direction appeared on page 421 of the April 1922 issue of COTTON, and was entitled "What's the Answer?" Any readers interested in referring to this mill man's experience and figures will find the article complete in that issue.)

"It is hard to tell just what is the best speed for breaking strength," continued Mr. Edwards. "On this I have never been able to keep it up. He will have his speed somewhere around 1,200 r. p. m. on a blade beater, and I tried it on the Kirschner at a speed of 1,000."

"I have a suspicion," interpolated the chairman, "that a whole lot of people leave out the consideration of real careful settings on beaters when they change these speeds."

"The beaters on my breakers are set to 5/16 of an inch from the feed roll; on the intermediates, ¼ inch; the Kirschner beater in the finisher to ⅛ inch or just as close as I can get it without rubbing. I find by setting it close it will not hurt the staple and it will help in cleaning." This statement was from Mr. Edwards.

Next was an experience from Chairman Burnham. "We had been getting a low breaking strength on 30s, with ⅞-inch cotton, around 51 pounds," he said. "We reduced the beater speed on the Kirschner from 1,030 r. p. m. to 850 r. p. m., and re-set the beaters. Then we went out into the card room and reduced the licker-in speed from 437 to 375, and carried the cotton on through with the lower speed, and we didn't get the breaking strength. Can you account for that?"

Mr. Edwards said he had made some tests with low licker-in speeds and that "with the low licker-in speed you don't get the cotton as clean as with the higher licker-in speel; there is more foreign matter and the rolls have a tendency to bite the fiber and break it and therefore your yarn is weaker. What we must do is get all the trash out of the yarn that we can. The more trash and the more short fibers we take out the more uniform we get the fibers in length, and the breaking strength is going to stay up when you do that."

"That seems to explain it," agreed the chairman.

"How many of you men present have made tests along this line—to determine the relation of the picker room beater speeds to the breaking strength?" he continued. "There is a world of research in the picker room. No one of us has reached perfection there, no one is willing to go home and say his picker room is in the best condition possible. Some slight changes, I find, get better results, but right along this line of better results I have had some mighty funny experiences. I went into a picker room once and was going to try to make some changes to get better results. I cut down speeds and cut down speeds, and set the machines up properly, or at least what I thought was proper. The breaking strength was better (with two processes of picking) and we said, 'That's fine,' and figured we could cut out a process, so we pushed our intermediates over against the wall, and after running for about three months without them our breaking strength started going down. It was good at first and then it went down, down, down, all the time. Of course there was a reason. In going back over the proposition we found that we had gone into our picker room—just as bad as most of them and perhaps as good as most of them—and taken that breaker and that finisher and made good settings, yes, and the machines were working ideally and of course we got better breaking strength, but when those machines got into the same shape as the three processes were, they wouldn't do any better or as good, and from that we concluded that we'd better slide those intermediates back into place, and *look after* our picker room.'

"I had the same experience," said Mr. Cordle.

"I had the same thing happen on the drawing," continued Mr. Burnham, "just to show you that one lesson wasn't enough. But I do believe that one good process of drawing will do a lot better work than two poor ones. However, I had a list of the men present at one of our meetings in the Carolinas who had tried going from two processes of drawing to one process, and I believe that I am very safe in saying that at least 75 per cent of them are back on two processes now."

"Can anyone tell me what space should be allowed in the dust room per fan on the pickers?" asked Mr. Hazel-

wood. "I have a dust room that is too small, and I am confident that I am getting some back draft."

In replying to this question, Mr. Edwards said that at Lancaster they have "a picker room that is 100 x 127 feet, with the dust room in the basement beneath." The dust flue, he said, is put about 20 feet from one wall, giving a dust room about 107 x 100. They have 34 machines that blow into that dust room. Mr. Burnham asked the size of the flue and Mr. Edwards replied that it was something like 7 x 20 feet, he said the dust room was just about high enough for a tall man to stand up in.

Mr. Hazelwood stated later that Mr. Edwards had about twice the amount of cubic feet of air to each picker that he has. Mr. Cordle asked Mr. Hazelwood whether the fan from the condenser was connected into the room, and the reply was that it was, but that the same trouble existed before they put it in.

"Has anyone noticed," asked Mr. Burnham, "as the cotton comes from the opener room to the Morton distributor, any fine sheet of off-color short fiber winding up over the condenser cage? We have not had it, and I have asked several people who replied no, and I was wondering if anyone had noticed it and what the cause for it would be." Mr. Edwards suggested that the trouble might be caused by an improper fan speed, or the doffer roll on the condenser might not be knocking off the cotton that it should.

Another man said that a highly polished wire was needed and still another suggested that the damper was not set right, and it was pointed out that a faulty setting of the damper would have a tendency to hold the cotton there.

"A fellow wrote me and wanted to know if anyone had reported anything like that," said Mr. Burnham in explanation of the question.

The morning session adjourned at this point for the regular "Dutch" luncheon, which was held in the main dining room of the Inn. Scott Roberts, president of the Adelaide Mills, Anniston, spoke a few choice words of welcome to the visitors. David Clark acted as toastmaster, and called upon members for expressions in connection with the Association work among whom were: J. O. Edwards, member of the Board of Governors; J. D. Loner, superintendent, Dwight Manufacturing Co., Alabama City, Ala.; and James A. Greer.

Following the luncheon, the men returned to the meeting room for

The Afternoon Session.

The first feature of the afternoon session was a paper on "The Action of the Card on Cotton," by J. O. Edwards, of Lancaster, S. C., who said:

"When this subject was given me it seemed that it would be rather hard to find something to talk about. But after thinking the subject over, it came to my mind that this was to be a practical discussion, and of course the different tests we had been conducting would be of interest to you.

"After various tests made with feed plate settings the general conclusion seems to be that for print cloth numbers made of 1 to 1 1/16-inch cotton 17/1000 of an inch is the best setting. However, we do not say that this will be the best setting for all mills in the case of a dull licker-in, but with a good, sharp licker-in and the cotton not below middling, this setting will give good results.

"One mill running 50 per cent low grade cotton and 50 per cent strippings, making mop and carpet yarns, was having trouble with cloudy sliver caused by the licker-in pulling in flakes or bunches of cotton. They decided the feed roll needed more weight and to get this they took off the cast iron feed roll weight and attached a strong coil spring with adjustable thumb screw. This gave them a much better looking sliver and helped the evenness of the work considerably.

"Various tests have been made with licker-in speeds ranging from 300 to 750 r. p. m. With the low speed we did not get any better breaking strength, as we expected, but we did get a much trashier sliver. With the higher speed we of course got a much cleaner sliver and to our surprise the breaking strength was about as good as with a speed of 455 r. p. m. Therefore for print cloth numbers we decided that the speeds sent out by the builders gave as good results as we could get.

"However, the mill on low grade yarns, using 50 per cent strippings and 50 per cent low grade cotton, feeding an 18-ounce lap making a 70-grain sliver, did improve their work and got better breaking strength by increasing the speed of the licker-in from 455 to 525 r. p. m.

"One mill tried slowing down the flats and found by this test that the grade of strippings was much lower and the work no better. They then tried speeding up the flats which gave them a much better grade of strippings and some cleaner work.

"Then the question came up about reversing the flats and this was tried out with the results that they were able to get out more neps than in any other test they had tried.

"There has been much discussion about uneven yarn in the textile journals and at our meetings, and I want to call your especial attention to uneven work on cards. Very few mills realize the amount of bad work they make on cards while laying down laps and stripping.

"I am going to give you a report which many will be surprised at, but if you don't believe it is going on in your mill, just try putting a man at making these tests and report to us at our next meeting, that is if you will tell us honestly what you found.

"We put a man weighing behind card hands as they changed laps, on cards making a 48-grain sliver with the following results: Our weights ranged between 40 and 79, as follows: 40, 44, 53, 50, 70, 49, 74, 58, 60, 50, 52, 78, 41, 58, 50, 79. On the same cards and with the same card hand, after we had been weighing this sliver for several weeks, we got these results: Our weights ranged from 35 to 57, as follows: 57, 50, 48, 56, 40, 43, 46, 45, 49, 55, 51, 46, 54, 35, 38, 47, 44, 40. This great variation will no doubt seem unreasonable to you and if it does, please go to a card yourself and see if you can lay a lap down without an unreasonable variation. It will pay any mill to weigh behind card hands until they are putting on their laps better. This same reasoning will apply to stripping only there is not quite as great a variation.

"The card setting for the tests reported on print cloth numbers are as follows: feed plate, 17/1000; mote knives top, 10/1000, bottom 7/1000; licker-in to cylinder, 10/1000; flats, 10/1000; doffer to cylinder, 7/1000; comb to doffer, 29/1000; back plate bottom, 17/1000; top, 29/1000; under screen, back 17/1000; middle, 34/1000; front ¼-inch; stripping plate, 22/1000.

and one said he was running between 1,400 and 1,500, who said he was running 1,485. "We find," he explained, "that we get better cleaning with that speed. A three-blade beater we run a little less. We get out more motes with the higher speed." No others indicated the speeds they used.

"Have you tested it for breaking strength?" asked the chairman, referring to the product of the 1,485 r. p. m. beater.

"Our yarn is for hosiery mill use, and breaking strength is not so essential as cleanliness," was the reply, "although we did test some yarns for warp and they broke standard."

Going onto the intermediate picker with regard to speeds of beaters, one man indicated the use of a speed between 1,100 and 1,200 r. p. m.; one between 1,200 and 1,250; one a speed of 1,325 r. p. m., saying he had it at 1,500 and cut it down.

On the Kirschner beater in the finisher, one man said he ran this at 950 r. p. m., two between 950 and 1,050, and one man faster than 1,050, who said his speed was about 1,173, making hosiery yarns, 24s to 32s.

Mr. Burnham asked if anyone had any data on beats per inch. "Speaking of beats per inch," replied Mr. Edwards, "I had a little thing sprung on me the other day that has put me to thinking about it. A young man at the mill said to me, 'You are always talking about the beats per inch; did you ever think about the beats per ounce?' Just think about that: you feed a heavier lap through and you of course are putting more ounces through.

"Our beats per inch are about 24 on the breakers, 45 on the intermediates, and around 58 on our finishers, and we have a breaking strength that is not up to standard. I have made different tests on breaking strength with different speeds and different settings. I read an article some time ago about a man who ran two processes of picking and made a lap every 20 minutes, getting 110 beats to the inch. He claimed he got 62 pounds breaking strength on 30s yarn. That was something new to me, so I tried it, and the first weighing I got—using two processes with the Kirschner beater at 100 beats to the inch—the breaking strength ran from 58 to 62 pounds, but there was not a time after that for about three months that we got over 55 pounds, but it does give very good breaking strength."

(EDITOR'S NOTE—The article which prompted Mr. Edward's experiments in this direction appeared on page 421 of the April 1922 issue of COTTON, and was entitled "What's the Answer?" Any readers interested in referring to this mill man's experience and figures will find the article complete in that issue.)

"It is hard to tell just what is the best speed for breaking strength," continued Mr. Edwards. "On this I have never been able to keep it up. He will have his speed somewhere around 1,200 r. p. m. on a blade beater, and I tried it on the Kirschner at a speed of 1,000."

"I have a suspicion," interpolated the chairman, "that a whole lot of people leave out the consideration of real careful settings on beaters when they change these speeds."

"The beaters on my breakers are set to 5/16 of an inch from the feed roll; on the intermediates, ¼ inch; the Kirschner beater in the finisher to ⅛ inch or just as close as I can get it without rubbing. I find by setting it close it will not hurt the staple and it will help in cleaning." This statement was from Mr. Edwards.

Next was an experience from Chairman Burnham. "We had been getting a low breaking strength on 30s, with ⅞-inch cotton, around 51 pounds," he said. "We reduced the beater speed on the Kirschner from 1,030 r. p. m. to 850 r. p. m., and re-set the beaters. Then we went out into the card room and reduced the licker-in speed from 437 to 375, and carried the cotton on through with the lower speed, and we didn't get the breaking strength. Can you account for that?"

Mr. Edwards said he had made some tests with low licker-in speeds and that "with the low licker-in speed you don't get the cotton as clean as with the higher licker-in speel; there is more foreign matter and the rolls have a tendency to bite the fiber and break it and therefore your yarn is weaker. What we must do is get all the trash out of the yarn that we can. The more trash and the more short fibers we take out the more uniform we get the fibers in length, and the breaking strength is going to stay up when you do that."

"That seems to explain it," agreed the chairman.

"How many of you men present have made tests along this line—to determine the relation of the picker room beater speeds to the breaking strength?" he continued. "There is a world of research in the picker room. No one of us has reached perfection there, no one is willing to go home and say his picker room is in the best condition possible. Some slight changes, I find, get better results, but right along this line of better results I have had some mighty funny experiences. I went into a picker room once and was going to try to make some changes to get better results. I cut down speeds and cut down speeds, and set the machines up properly, or at least what I thought was proper. The breaking strength was better (with two processes of picking) and we said, 'That's fine,' and figured we could cut out a process, so we pushed our intermediates over against the wall, and after running for about three months without them our breaking strength started going down. It was good at first and then it went down, down, down, all the time. Of course there was a reason. In going back over the proposition we found that we had gone into our picker room—just as bad as most of them and perhaps as good as most of them—and taken that breaker and that finisher and made good settings, yes, and the machines were working ideally and of course we got better breaking strength, but when those machines got into the same shape as the three processes were, they wouldn't do any better or as good, and from that we concluded that we'd better slide those intermediates back into place, and *look after* our picker room.'

"I had the same experience," said Mr. Cordle.

"I had the same thing happen on the drawing," continued Mr. Burnham, "just to show you that one lesson wasn't enough. But I do believe that one good process of drawing will do a lot better work than two poor ones. However, I had a list of the men present at one of our meetings in the Carolinas who had tried going from two processes of drawing to one process, and I believe that I am very safe in saying that at least 75 per cent of them are back on two processes now."

"Can anyone tell me what space should be allowed in the dust room per fan on the pickers?" asked Mr. Hazel-

wood. "I have a dust room that is too small, and I am confident that I am getting some back draft."

In replying to this question, Mr. Edwards said that at Lancaster they have "a picker room that is 100 x 127 feet, with the dust room in the basement beneath." The dust flue, he said, is put about 20 feet from one wall, giving a dust room about 107 x 100. They have 34 machines that blow into that dust room. Mr. Burnham asked the size of the flue and Mr. Edwards replied that it was something like 7 x 20 feet, he said the dust room was just about high enough for a tall man to stand up in.

Mr. Hazelwood stated later that Mr. Edwards had about twice the amount of cubic feet of air to each picker that he has. Mr. Cordle asked Mr. Hazelwood whether the fan from the condenser was connected into the room, and the reply was that it was, but that the same trouble existed before they put it in.

"Has anyone noticed," asked Mr. Burnham, "as the cotton comes from the opener room to the Morton distributor, any fine sheet of off-color short fiber winding up over the condenser cage? We have not had it, and I have asked several people who replied no, and I was wondering if anyone had noticed it and what the cause for it would be." Mr. Edwards suggested that the trouble might be caused by an improper fan speed, or the doffer roll on the condenser might not be knocking off the cotton that it should.

Another man said that a highly polished wire was needed and still another suggested that the damper was not set right, and it was pointed out that a faulty setting of the damper would have a tendency to hold the cotton there.

"A fellow wrote me and wanted to know if anyone had reported anything like that," said Mr. Burnham in explanation of the question.

The morning session adjourned at this point for the regular "Dutch" luncheon, which was held in the main dining room of the Inn. Scott Roberts, president of the Adelaide Mills, Anniston, spoke a few choice words of welcome to the visitors. David Clark acted as toastmaster, and called upon members for expressions in connection with the Association work among whom were: J. O. Edwards, member of the Board of Governors; J. D. Loner, superintendent, Dwight Manufacturing Co., Alabama City, Ala.; and James A. Greer.

Following the luncheon, the men returned to the meeting room for

The Afternoon Session.

The first feature of the afternoon session was a paper on "The Action of the Card on Cotton," by J. O. Edwards, of Lancaster, S. C., who said:

"When this subject was given me it seemed that it would be rather hard to find something to talk about. But after thinking the subject over, it came to my mind that this was to be a practical discussion, and of course the different tests we had been conducting would be of interest to you.

"After various tests made with feed plate settings the general conclusion seems to be that for print cloth numbers made of 1 to 1 1/16-inch cotton 17/1000 of an inch is the best setting. However, we do not say that this will be the best setting for all mills in the case of a dull licker-in, but with a good, sharp licker-in and the cotton not below middling, this setting will give good results.

"One mill running 50 per cent low grade cotton and 50 per cent strippings, making mop and carpet yarns, was having trouble with cloudy sliver caused by the licker-in pulling in flakes or bunches of cotton. They decided the feed roll needed more weight and to get this they took off the cast iron feed roll weight and attached a strong coil spring with adjustable thumb screw. This gave them a much better looking sliver and helped the evenness of the work considerably.

"Various tests have been made with licker-in speeds ranging from 300 to 750 r. p. m. With the low speed we did not get any better breaking strength, as we expected, but we did get a much trashier sliver. With the higher speed we of course got a much cleaner sliver and to our surprise the breaking strength was about as good as with a speed of 455 r. p. m. Therefore for print cloth numbers we decided that the speeds sent out by the builders gave as good results as we could get.

"However, the mill on low grade yarns, using 50 per cent strippings and 50 per cent low grade cotton, feeding an 18-ounce lap making a 70-grain sliver, did improve their work and got better breaking strength by increasing the speed of the licker-in from 455 to 525 r. p. m.

"One mill tried slowing down the flats and found by this test that the grade of strippings was much lower and the work no better. They then tried speeding up the flats which gave them a much better grade of strippings and some cleaner work.

"Then the question came up about reversing the flats and this was tried out with the results that they were able to get out more neps than in any other test they had tried.

"There has been much discussion about uneven yarn in the textile journals and at our meetings, and I want to call your especial attention to uneven work on cards. Very few mills realize the amount of bad work they make on cards while laying down laps and stripping.

"I am going to give you a report which many will be surprised at, but if you don't believe it is going on in your mill, just try putting a man at making these tests and report to us at our next meeting, that is if you will tell us honestly what you found.

"We put a man weighing behind card hands as they changed laps, on cards making a 48-grain sliver with the following results: Our weights ranged between 40 and 79, as follows: 40, 44, 53, 50, 70, 49, 74, 58, 60, 50, 52, 78, 41, 58, 50, 79. On the same cards and with the same card hand, after we had been weighing this sliver for several weeks, we got these results: Our weights ranged from 35 to 57, as follows: 57, 50, 48, 56, 40, 43, 46, 45, 49, 55, 51, 46, 54, 35, 38, 47, 44, 40. This great variation will no doubt seem unreasonable to you and if it does, please go to a card yourself and see if you can lay a lap down without an unreasonable variation. It will pay any mill to weigh behind card hands until they are putting on their laps better. This same reasoning will apply to stripping only there is not quite as great a variation.

"The card setting for the tests reported on print cloth numbers are as follows: feed plate, 17/1000; mote knives top, 10/1000, bottom 7/1000; licker-in to cylinder, 10/1000; flats, 10/1000; doffer to cylinder, 7/1000; comb to doffer, 29/1000; back plate bottom, 17/1000; top, 29/1000; under screen, back 17/1000; middle, 34/1000; front ¼-inch; stripping plate, 22/1000.

"The card setting for tests reported on the coarse numbers are as follows: feed plate, 12/1000; mote knives, top 17/1000; bottom 7/1000; licker-in to cylinder, 10/1000; flats, 10/1000 medium; doffer to cylinder, 7/1000; comb to doffer, 22/1000; back plate bottom 17/1000; top 29/1000; under screen, back 29/1000; middle, 58/1000; front, ¼-inch; stripping plate, 22/1000."

Following the reading of his paper, Mr. Edwards presented the totals of some test figures on the variation in sliver due to the laying down of laps at the card, and these were as follows: "Over a period of six months, taking a 48-grain sliver as standard, our weights ran above the standard 46.4 per cent, and below the weight 24.8 per cent, making a total of 71.2 per cent extreme variation from standard."

Mr. Burnham at this point stated that there are a number of places in the card room where conditions similar in effect to this one might be found, and suggested to the men present that they make the same tests as Mr. Edwards to determine the actual conditions. He further mentioned the practice of putting on more weight when using low grade or mixed cotton, pointing out that some difficulty might be eliminated by putting more weight on the feed roll of the cards. "The same thing applies in the spinning," he continued, "Take the standard weights that you are running and add some, if you are running waste, and you will get better results with a little more weight on the rolls. When you are running a large percentage of waste you are running it into coarse numbers, and it is heavy when it comes from your rolls."

"Mr. Edwards," continued the chairman, "has endeavored, at the request of the chairman, to give us the settings for print cloth numbers, following out an endeavor to standardize, if such a thing is possible. He has given us here the settings of a card in order to start the discussion. For print cloth numbers, he opens up the feed plate to a 17/1000 gauge. Will somebody start this; if you are setting different from this, get up and tell us about it. How many are setting closer than this?" Ten indicated that they were. One man said he sets to a 15/1000 gauge on 18s to 26s yarn.

The next question was that of changing the flat speeds. The direct question from the chairman, "How many have reduced the speed of the flats from standard?" brought this answer from J. H. Garrett, overseer carding, Central Mill, Sylacauga, Ala.: "I didn't reduce the speed of the flats, but I did cut down the speed of the cylinder to 152." Asked why he did this, he said it was in order to get a closer setting. Further inquiry developed that Mr. Garrett has been doing this about two years, he is carding 68 pounds a day per card, on 24s to 32s yarn, using good cotton with no waste.

"At the last carders' meeting," said Mr. Clark, "that question came up, and practically everyone there who had tried a speed of 160 on the cylinder didn't get good results."

Another man asked Mr. Garrett whether his card room is on the first or second floor, and the reply was that it is on the ground floor.

"We have reports," stated the chairman, "where they have raised the cylinder speed to 175 without any bad results; that is possible, if the points of the wire are good. With a loosely fastened wire and the higher speed—the centrifugal force—will make the teeth raise a little."

Getting back to the flat speeds, Chairman Burnham continued, "I went into one mill where a man had reduced the speed of the flats and had reduced his strippings 33½ per cent. I noticed that the fly in the spinning room was awful. He was taking it through in the roving and leaving it in until it got to the spinning room."

Mr. Edwards reported a test along this line with similar results.

"I do believe that the speed of the flats is something that we can experiment with to advantage," Mr. Burnham said.

Guy L. Melchor was called on for information in this connection, and referred the question to H. B. Miller, who said, "I can't tell you anything about reducing the speeds, but I can about increasing them. I think it depends on the cotton a man is using and the product he is making. Where you are on strips I think it helps, and the way to do it is to change the worm drive from a single to a double worm, and that's all there is to it. You will find that where the flats fill up on the single worm that they will not do so on the double. I have done that with very good success. You get 30 per cent more strippings by doubling the speed."

"What about card drafts?" Chairman Burnham asked in opening up the discussion on this subject. "I notice in COTTON that some of its contributors have taken the bit in their teeth and gone ahead on this. Suppose we get a show of hands on card drafts. From 80 to 100?" Four indicated that they were using drafts within these limits. "From 100 to 110?" There were six affirmative answers. One man indicated a draft between 110 and 120. Mr. Smith said he is using 135. "I use a 12-ounce lap, and card a 42 grain sliver; you can figure that. We set closer than some of you. I set the feed plate to a 12; cylinder to licker-in, a tight 7; the flats to a 7; cylinder to doffer, tight 7 and loose 5. Fly comb set to 10; carding 62 pounds a day."

"What do you call a loose 5?" somebody asked. "Where you can just feel it," was the reply. "The reason I asked, continued the questioner, "was that I went into a mill once and a man told me he was setting to a 'loose 10,' and I went around and tried it and I got a 17 out of that 'loose 10.' " Mr. Smith indicated he is using 1 5/16 inch cotton, and the chairman explained that in the discussion on drafts he had intended referring to 1-inch staple only.

Mr. Smith emphasized the necessity of proper grinding of cards, saying that "I grind my cards about every five or six weeks."

Mr. Burnham stated that Mr. Smith's case was an exception with his draft. He next asked for any experiences in the testing of a draft as high as 120. L. B. Colbert, overseer of carding, The Trion Company, Trion, Ga., said he had changed one card and ran it three days, but found that the ends would not stay up and that the selvage was too thin.

"You found that just on the card, Mr. Colbert, you didn't run it out into yarn at all?" asked the chairman. Mr. Colbert replied that he stopped his experiment with the card.

Chairman Burnham asked Mr. Edwards if he had made any tests in this connection, and the latter gentleman replied, "No, but we do contemplate making some tests along this line. Our cards are so arranged that we cannot get

over 120 draft, but we are working to change things so that we can get up to 130 or 140 and upward."

Here Mr. Clark reported that a man who did not wish his name to be mentioned had stated to him that after making exhaustive tests on the question of card drafts over a period of two years, he had found that the work improved on drafts up as high as 125, but after going higher than that, the strength began going down again. This mill is using 122 for the best strength, he said.

At this point, it was brought to the attention of the chairman that T. H. Rennie, vice-president and general manager of the Pell City (Ala.) Manufacturing Company, who is a past president of the American Cotton Manufacturers' Association, had entered the room, and Mr. Rennie was called upon for a few remarks in connection with the carding discussion. Mr. Rennie spoke in somewhat of a reminiscent vein over his experience of 40 years in the textile manufacturing game, saying in part:

"I was running a cotton mill 40 years ago, and I remember shortly after that I purchased some revolving flat cards, and a man from New England told me that I was crazy, that I had made a big mistake. And here you are speaking about reversing the direction of the flats. The originator of the revolving flat card, when he made his first card, designed them to run in the reversed direction, but found that the loss in waste was so great that he had to change his plan by having the flats run in the same direction as the cylinder.

"The only thing I have ever seen along this line was gotten up by a man, since dead, who devised an improvement on the stripping arrangement. The first half of the card was stripped at the center of the card and the strips carried over to the side, and then the other flats were stripped on the front. He got a remarkable result, but why it was never taken up by the manufacturers of cotton mill machinery, I have never understood. I watched it for two years, and it gave wonderful results, because all the heavy stuff was taken out in the center of the card and the remainder was very light.

"I think you men will find, the longer you are in the mill business and the more disgusted you get with it, that your drafts will be practically regulated by the stuff you are turning out at the other end of the mill. One gentleman— Mr. Smith, I have seen him before— spoke about a 12-ounce lap and a 42-grain card sliver. Of course, that is possible when a man is making that kind of stuff, but if a man was running a 22,000-spindle mill, turning out 120,000 pounds a week, he wouldn't do it by carding 62 pounds a day to the card.

"I think the greatest difficulty in the American mills today is the fact that they used to have the idea that a card could be run like a picker. If you had to have 200 pounds a day, put it through; but today the American manufacturers are waking up to the fact that there is a difference between the picker and the card.

The gentleman from Sylacauga—Mr. Garrett; I've seen him before, too— is carding 68 pounds a day, and you are going to get better results if you do not try to shove it through the cards. Why, the Englishman thinks he is playing heck if he cards over 550 pounds per card in 54 hours, and the Englishmen on fine numbers— they would never think of carding more than 300 pounds to the card in a week. And they are the greatest carders in the world. The thing you carders want to keep in your heads—if you build mills of your own—is that you have enough cards to take care of what is going through. Why, in making a heavy export sheeting, some carding was put in with the idea of carding 175 pounds per day with a card. We are gradually waking up to the fact that we must have enough carding surface to card the cotton.

"Miller says he has speeded up his flats, and of course he gets better results on low-grade stock. We are coming to the time now, with electrification in the mills, that allows us to do things different from the way we used to have to do them when we had a big engine and had to run everything all the time. The mill is more mobile today.

"I do not think there is so much in some of the theories that we are always working on along certain lines. One of the important things in the English system is a good lap. The picker room in the English system is the foundation, and it is yours. If you do not get a good lap, you are not going to get good yarn. If you have a good lap, regardless of drafts, etc., you are going to get good results.

"The people who buy the cotton do not card it. They will give you cotton from 5/8 to an inch in length up and you will find many mills buying compressed cotton where it is taken right out and fed into the feeders, and you have to expect that they will have trouble in keeping numbers.

"In England the mills are all on finer work and they open up their cotton and let it age for a week ahead. The cotton opened last week is used for spinning this week. They give the cotton a chance. Some day we are going to get down where we do things that the greatest spinners in the world do, and we will find that the English are doing the things that will make good yarn.

"There is nothing that is of any more value to you men than these meetings," concluded Mr. Rennie. "You must never lose sight of the fundamental principle of your job— the picker room. If the pickers are not right, there won't be anything right in the mill. If your pickers are right, and the cards are right, you are going to get good results unless somebody else makes a bungle."

At the conclusion of Mr. Rennie's remarks, the chairman brought the discussion back to the question of licker-in speeds. Calling for a show of hands, he asked how many were running over 450 r. p. m., on the licker-in. Mr. Edwards says he runs 455 r. p. m. Two indicated the use of a speed between 425 and 450 r. p. m. No one said he was running lower than 400.

Mr. Edwards in discussing this subject, also said that they had experimented with slower flat speeds, and that then the flats were slowed down, the strippings were of a good deal lower grade; when they speeded up the flats it took out more and gave some cleaner work. He pointed out that the slower flat speed would allow the waste to go through into the spinning room where it would get all over the creels and on the floor.

Fly Frames.

The next feature was the presentation of a paper on "Fly Frames and Ideas on the Keeping of Numbers," prepared by Robert Huskey, overseer carding, Whitney (S. C.) Manufacturing Co. In Mr. Huskey's absence, this was read by the acting secretary. In this paper, Mr. Huskey said:

"This is not a very extensive treatise on the subject of

fly frames, but the writer has had quite a number of years experience and will endeavor to give you briefly a few important facts pertaining to this subject.

"First I want to say something about the speed of slubbers. It has been my experience that the slower they are run, without cutting down the production, the better the results will be. Some time ago we slowed down our spindle speed on a 11 x 5½-inch slubber from 730 r. p. m. to 548 r. p. m. and took out twist to build up our front roll speed in order to get about the same production. We were not able to build up the front roll speed to the original point, but in consideration of the better running work we figure the production is better than it was with the fast spindle speed. The results so far have been highly satisfactory. This should apply equally as well on intermediates and fly frames. This will cause less wear on the machines and enable you to run with less power.

"In regard to twist in roving, I think just enough to keep it from stretching and breaking back at the next process is sufficient. It is true, a frame will run better with more twist, but there is a danger of covering up many defects that should be remedied in the preceding processes, such as bad carding, singlings on drawing, badly pieced ends and a number of other things that could be mentioned.

"From experience I have learned not to have any standard settings for rolls on fly frames. This should be watched carefully and tests made as the cotton is changed from time to time. The amount of stock as well as the quality should be considered when setting rolls. Roll setting is more important where short staple cotton is used.

"Another thing I want to speak of is the cone belt. I notice in some textile papers that belt dressing is prescribed for the cone belt. This should never be allowed for it will cause the roving to be stretched, besides other bad results when the dressing is first applied. The attendant will have trouble when winding the cone belt back at doff time; besides it is not necessary to put belt dressing on a cone belt, regardless of the load it carries. If the cone belt slips the cause should be ascertained and remedied accordingly. You will generally find in such cases that the bearings at the lifting gear or other slow moving parts of the frame have not been properly oiled or need setting. For this purpose, I would advise that a thin coat of paint be put on the small end of the bottom cone about fifteen inches from the small end of the cone. The belt should be the right length, so that the cone will hang just at the correct angle to give the proper weight on the belt. A good rider should always be placed on the cone belt to assist in doing the work. The best belt the writer has ever seen is a one-inch belt with a two-inch rider riveted or laced to it. This gives a one-inch belt width in contact with the cone. We have one in our mill that has been running about three years and it is still a good belt.

"I have dealt so far with the part played by the machinery toward getting good results from fly frames, but I want to say here that the greatest asset an overseer has is well trained and conscientious operatives. A few minutes spent every day training help in the art of running frames will increase production and improve the quality and be for the best interest of everybody concerned. I have in mind a young girl who in less than a year has developed into an efficient frame hand, due to good training. Any frame will make bad work, no matter how well it is fixed, if the operative—whether through ignorance or otherwise—does not do his part. The problem is in improving the personnel.

"Now as to keeping numbers, I think this job should be up to one man, and of course he should have the entire cooperation of the foremen in the plant. I have known of numbers being kept successfully where the carder kept the warp and the superintendent kept the filling numbers. This was in order to keep peace and harmony between the carder and the spinner, as the spinning foreman did not want to lighten his filling at the request of the carder. There are many things that enter into the keeping of numbers correctly. I think the place to keep numbers is on the finisher pickers. The writer has kept numbers for a mill that had a 12,000-pound production per day, and would go three months at a time without changing gears anywhere, but would lighten or heavy on laps as was necessary. The was on coarse numbers, but I believe that much changing of gears on finer numbers can be eliminated this way. In wet weather, beams at the warpers will weigh from six to ten pounds heavy, but will return to normal when the weather clears up without necessitating a change on the machines."

At the conclusion of this paper, Mr. Burnham added that they were surprised at their mill to find how much better could be done with just a little bit under recognized standard twist. "I got this idea at an Association meeting," he said, "that it was the right thing to do; there should be just enough twist in it to pull it through to the next process."

Mr. Cordle again questioned Mr. Miller concerning the Exposition Mills, at Atlanta, where the latter gentleman was formerly overseer of carding when J. Stoney Drake was the superintendent, asking this time what twist Mr. Miller put in the speeder roving.

"About five teeth over standard," replied Mr. Miller, "but that was only on the speeders." He further indicated that sometimes the breaking strength was up to standard, depending on the cotton. "At that time I was using Draper's old standard, and the standard break was 92 on my yarns, 19s; sometimes when we got good cotton we got it up to 100."

Referring to the question of cutting the spindle speed on roving frames, Mr. Burnham said that—as pointed out in Mr. Huskey's paper—his carder had suggested "that we cut the spindle speed and take out twist and build the front roll speed back up, and it worked fine. We have the spindle speed cut away down from where it was, and I have cut out the vibration and repairs—I have cut the repair bill in half."

"I want to ask a question," requested Mr. Edwards. "When you cut the spindle speed on a frame do you decrease or increase the twist?" The reply was that the mere changing of speed didn't change the twist, that this is done through another means, but is made possible by the lower speed.

Mr. Rennie related an experience in connection with this discussion. He said that a number of years ago a man had gone to a big mill as an expert, the trouble with the mill being that the carding was away behind and could not keep up with the spinning room—some of the frames were stopped all of the time waiting on the carding. This expert went to that mill for the purpose of observing it

for three weeks, and then he went to the superintendent and told him that his roving frames were running altogether too fast. The superintendent, Mr. Rennie said, became slightly riled up, and replied, "Tom Rennie sent you down here, and the first thing you do is to ruin the mill." The young expert was a little cocky, "as young men are," continued Mr. Rennie, and he insisted on his point. "You want something to get the work through the carding department," he told the superintendent, "and your sole trouble is speed." Finally after consideration the superintendent said, "Well, I am going to let you do what you want to do," and, calling in the master mechanic, told him, "You make any changes in the card room that this man wants." They reduced the speed of the slubbers, intermediates and speeders 20 per cent, continued Mr. Rennie, very much to the horror of the superintendent, "but in three weeks they had the card room going to the point where they had to shut it down on Friday because they didn't have any bobbins."

Mr. Burnham related a similar account of a man in the Carolinas, who seemed very much horrified because "all their superintendent had done since he had been there was to cut down speeds," when as a matter of fact that was all that needed to be done.

"I believe that we can cut down speeds in the South Carolina mills," continued the chairman. "It is not always that we are allowed to do those things. The man must have the confidence of his management before he is allowed to take many drastic steps that will allow him to cut down speeds to the point where it will affect the month's or the week's, or the year's production. However, I believe we would all do well to look into the question of spindle speeds on all the fly frames."

"I will say one thing," added Mr. Edwards, "With the lower spindle speed you will have better running work, and naturally with better running work you can get off a larger production. If it took you just a little longer to make a doff than it did before the result is that you have less ends to put up."

Recalling the exact figures on a test in reduction of speed and twist, Mr. Burnham said that in this experiment, "these speeders were running a 3 hank roving, with a little bit over Draper standard twist and that stuff was not running very well on the frames. We cut the spindle speed down something like 25 or 30 per cent, and built the front roll back almost to where it was formerly, putting on a larger twist gear, and for the first 15 hours it was run after the change we didn't have one end down. And it has run almost that well ever since. That's really 'good running work,' when you can run for 15 hours with no ends down."

Drawing Frames.

After this discussion of roving frames, the subject of drawing was taken up, and the first general question from the chairman was with reference to front roll speeds. His question, "Who is running a front roll speed as high as 400 r. p. m.?' brought no affirmative responses. Three said they were running between 350 and 400; nine between 300 and 350; three between 250 and 300; and none between 200 and 250.

Responding to a direct question from the chair, Mr. Miller replied that he had found that the lower the speed the better the running of the work.

"I don't know that there is any one question that has been as extensively discussed as this one of cutting down speeds on the drawing frames," said Mr. Clark in connection with this discussion, referring to the previous carders' meetings in the Carolinas. He cited an instance of a man using 220 r. p. m., with a remarkable increase in the breaking strength of the yarn.

A question put to the audience indicated that practically all were using two processes of drawing, while no one said he was using only one process. Mr. Burnham said "We tried one process, but we could not see our way clear to keep running it."

Mr. Clark stated that several of the groups of fine yarn mills in and around the Gastonia and Charlotte section in North Carolina are now using the one-process drawing system—such as the mills of D. E. Rhyne, John C. Rankin, and others. He then recounted an experiment at a former meeting of carders in Charoltte when Marchall Dilling, then chairman of the carders' committee, had brought samples of two yarns of the same make, one spun with one process of drawing and the other with two processes of drawing, the only distinguishing mark between the two being that one yarn was marked with a green tag, and the other with a pink tag, knowledge of which was which being only in the possession of the chairman. Following the discussion between some of the men with reference to the relative quality of yarn made with the one-process and the two-process drawing systems, these samples were passed among the audience, and Mr. Clark stated that about eighteen men selected the yarn with the pink tag as being the better yarn of the two, only one man picking the green tagged yarn—and the pink tag was on the yarn spun with the one process of drawing.

He further reported that a new superintendent going into a Carolina mill and seeing only one process of drawing in the lay-out, immediately declared that he would have to have another process put in, but after making some tests on the yarn, had decided to continue running the mill as it was.

The Chairman next asked if anyone had installed an evener motion on drawing frames, but no experiences were reported. Mr. Burnham stated that he had seen this attachment in operation at an eastern mill.

Discussing drafts on drawing frames, Mr. Edwards reported that he has been making tests on short drafts—making two numbers, using four ends up instead of six, and "I was looking at it before I left the mill and it looked very nice."

An Anniston man reported that a local mill having trouble had put up five ends instead of six, and that they got results in bettering the breaking strength by three or four pounds. He stated that in changing over, the drafts were disproportionate, and after trying to find someone who could tell him how to figure these drafts, he finally ran across Mr. Rennie on the train and that gentleman replied to his question promptly, "Between the back and third rolls, the 6th root of the number; third and second the fourth root; between the first and second, the square root."

Replying to a question as to the front roll speed at the mills using the one-process drawing, Mr. Clark said this was 220 r. p. m., and continued, "I would like to call your

attention to the fact that if you will put the drawing sliver through three, four and five processes, you will find that it will get weaker and weaker, and I think that proves that the drawing does injure the staple."

Mr. Miller reported that at Exposition by going onto the single process they were able to cut the front roll speed down to 150 on all the drawing, and "I would like to say that the spinners were running 12 and 14 sides, on 19s yarn."

"There are two things that make for strength," observed Mr. Rennie at this point. "The natural twist or corrugation in the fiber, and the twist you put in. Drawing of course has two functions to perform: one is the leveling of the fiber and the other is the elongation of the staple. The more twist you put in the smoother you make the fiber, and the more corrugations you take out the more twist you must put in to retain the same strength."

One of our troubles, continued Mr. Rennie, "is the size of the front roll. No drawing frame should be made with an 1⅜-inch roll; you can't set the rolls properly under that condition. The old style drawing frame never had anything bigger than an 1⅛-inch roll, and I stand here to say there was never any better drawing made than on the old style frame, if it was properly looked after." The larger rolls, he said, were put in for a purpose; a larger production can be secured at the same speed, but "when you go to make an adjustment between the front and second rolls you can never do it as you should. When you set the larger rolls together you cannot get it down to the length of the ordinary staple run.

"It is one of the crying shames, the way they are building the 1⅜-inch roll top and bottom on the front of the drawing frame; it injures the stock and doesn't give you an even sliver. If we could get the machinery people to build these so that we could adjust them to local conditions things would be beter. That is one of the reasons why one process is better than two, as you get rid of half your trouble."

In closing the discussion, Mr. Burnham related an incident in a mill where the ends would not stay up on the drawing, and investigation showed that the boy who was running the frame on a hank basis was taking the ends from the front and running them back through again.

Chairman Burnham then expressed his appreciation to the members for their interest and help, and concluded the meeting with an earnest request that the men go home and try out some of the tests, pointing out from his own experience with previous discussions of this sort that while every test didn't produce startlingly successful results, the percentage of experiments that did turn out profitably were well worth the time and trouble.

Announcement was made that the next meeting of the spinners' division of the Association will be held in Spartanburg, S. C., about the middle of January.

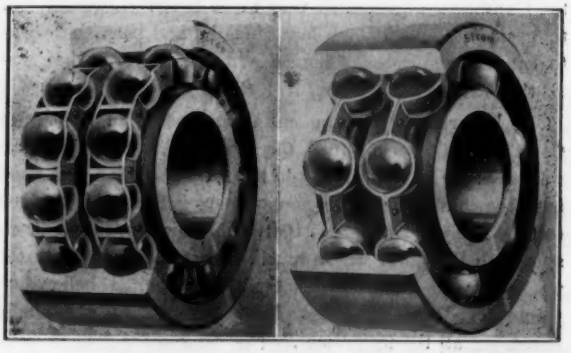
At 4:30 o'clock, following the adjournment of the meeting, the film "Thirsty Cotton" was shown to an interested audience of mill men by H. B. Rogers, of the Parks-Cramer Company. This film, brought to Anniston upon request, has been exhibited at a number of textile conventions and gatherings during the last few months, and shows the effect of proper humidification in the running of the work through the different processes. It was announced at the meeting that any mill managements desiring to have this film exhibited at their plants may have this done by application to the Parks-Cramer Company, at Charlotte, N. C., expressing their desire.

It is superflous to add, at the conclusion of this report, that the meeting was a most successful and helpful affair. Expressions from many of those present after the meeting were that they were going home and experiment and report at the next meeting of the division. The hospitality of the Anniston textile men is also to be mentioned as thoroughly enjoyable.

Double Row Bearings.

The success of Strom double-row bearings in many installations has resulted in the addition of these bearings to the U. S. Ball Bearing Mfg. Company's line of single-row radial, angular contact and thrust bearings.

Strom double-row bearings are of two types, standard and maximum. One of the outstanding features of these bearings is the retainer construction. Two independent



AT LEFT A DOUBLE ROW, MAXIMUM TYPE, RADIAL BEARING. AT RIGHT A DOUBLE ROW, DEEP-GROOVE STANDARD TYPE RADIAL BEARING.

riveted retainers are used, one for each row of balls, thereby insuring the same strength in each retainer as obtained in the single-row type of bearings. They are especially adaptable for installations requiring unusual bearing capacity in a limited amount of space.

These bearings are designed to carry heavy radial loads. However, owing to their construction, they are capable of supporting thrust loads also.

H. H. WILLIS is receiving the congratulations of his friends on the announcement of his marriage, on Saturday, December 23, to Miss Alice Moore, of Washington, D. C. Mr. Willis, it will be remembered, is a South Carolinian, a graduate of Clemson College, class of 1917, with a degree in textile engineering. Since that time he has been connected with the United States Department of Agriculture in the Bureau of Plant Industry, at Washington, D. C., as cotton specialist. Mrs. Willis is a native of Illinois, and is a graduate of Northwestern University. She is a daughter of Ernest R. Moore, and has resided in Washington since 1918.

S. D. STOKES has been transferred from overseer carding at the Marlboro Mills No. 1 and 2, McColl, S. C., to a similar position at the No. 5 Mill at Bennettsville, S. C.

L. R. OGLETREE has resigned as overseer of weaving at the Peerless Cotton Mills, Thomaston, Ga., and accepted a position at the Meritas Mills, Columbus, Ga.

Northeast Brazil as a Cotton Producer

BY DR. ILDEFONSO ALBANO.

The Federal Government of Brazil has begun an immense work of public improvement comparable in magnitude and economic importance to that carried on by the United States under the Reclamation Act. The undertaking consists of the irrigation of the great semi-arid region in the northeastern section of Brazil in the States of Ceara, Rio Grande do Norte, Parahyba, Pernambuco, Bahia and Pianby, lying between 5° and 10° south of the equator. These States have a present population of about 2,500,000 people and produce the highest grade long staple cotton, together with a fine quality of hides and skins. During past years this district has been subjected at intervals to severe droughts—or "seccas" as they are known in Brazil—which have on several occasions almost completely devastated the region, destroying the stock and thousands of the people, and paralyzing industry for long periods. The irrigation project will give relief from these seccas and at the same time multiply the normal production. Under irrigation the district will contribute a staple industry in connection with the culture of long staple cotton, which will be second only to the coffee industry of Brazil as an element of national economic stability.

For the prosecution of this irrigation development the Brazilian Government has entered into a contract with two English companies and one American company for the construction of great reservoirs and other works appurtenant to irrigation projects. The contract given to the American company calls for the construction of five great dams, known as Poco dos Paus, Oros, Piranhas, Sao Goncalo and Piloes. The dam at Pocos dos Paus will contain over 750,000 cubic yards, which will be one of the greatest masses of masonry placed in a dam of this character in the world. The dam at Oros will impound 3,000,000 acre feet of water, more or less, which will make it second to Elephant Butte, the largest artificial reservoir in the world. The three dams at Poco dos Paus, Oros and Piranhas will be 150 feet or more in height, which places them among the high dams of the earth. The dams at Sao Goncalo and Piloes will be more or less 60 feet in height and will be important portions of the proposed irrigation system. The waters impounded in the reservoirs will be utilized for the development of alluvial lands bordering the rivers whose waters are thus impounded.

For construction purposes each of the dams under the contract held by the American company is being equipped with a full complement of modern construction machinery electrically operated, the electric current to be generated by steam driven generators until such time as water power can be made available and be applied to the work. The work of equipping the dams began in August, 1921, since which time about 12,000 tons of modern machinery have been shipped and are now in process of installation at the dam sites, which are located about 350 miles in the interior, being reached from Fortaleza, Ceara, by meter gauge railways.

The administrative force on each dam is composed of American engineers, of whom about 75 are now in the country. The progress on the work is reported as satisfactory and it is expected that one of the dams will soon be in partial operation.

In addition to the mechanical equipment of the dams the American company is installing a clinker grinding plant to grind finished cement from cement clinker of American manufacture. (Cement clinker is cement in one of the final stages of manufacture, before being ground and pulverized ready for use. Clinker is unaffected by exposure to the weather and can be handled and shipped in bulk, thus saving the cost of barrels and earning a substantially lower freight rate.) The amount of cement used in the work will probably exceed 50,000 tons per year.

With this brief outline of what is being accomplished in the way of irrigation facilities for a background, the accompanying extracts from a paper presented to the eleventh International Cotton Congress at Stockholm by Dr. Ildefonso Albano, vice-president of the State of Ceara, mayor of Fortaleza, and director of the Commercial Association of Ceara, will indicate the possibilities of cotton cultivation in this section of northeast Brazil.

The chroniclers who accompanied the first explorers to Brazil all refer to the cotton plant, which was cultivated by the natives. The seed, ground and cooked, was used by them as food; the lint, separated from the seed by hand, was spun and woven into hammocks, which were called *inni*. Hans Staden, a Dutchman, who was prisoner of the Indians during several years, says that they also made of cotton a kind of sack, open at both ends, called *typpoy*, which they used as a shirt. Even after the Portuguese occupation the soldiers' hammocks were made by the Indian women.

Ceara was among the first regions of Brazil to export cotton, after the Portuguese occupation. In 1777 there were 1,170 kilos of cotton, grown on the Uruburetama-mountain, exported to Bahia; in the following year 3,510 kilos from identical source were shipped to Lisbon via Bahia. The cultivation of this staple grew quickly, so that at the end of the century the mean yearly crop of Uruburetama was 75,000 kilos. Farmers round Fortaleza, the principal settlement, also began to plant cotton. They were soon followed by planters from the fertile Jaguaribe-valley, which was one of the first regions in Ceara to be inhabited and cultivated; they succeeded in those days in exporting through the harbor of Aracaty 300,000 kilos of cotton a year.

At the beginning of the 19th century the yearly exports of cotton from Ceara amounted to from 450,000 to 600,000 kilos.

Cultivation of cotton continued with great activity until 1822, when its price dropped in the European market. About this time appeared also the rust that became a great drawback to its culture.

In 1851 the President of the Province distributed seeds, obtained in Rio de Janeiro, and introduced a gin, invented by Mullet. In the following year he reports that the American seed had been distributed among the farmers and that Mullet's gin, although of weak workmanship, worked quicker and prepared cleaner cotton than the old wooden gins.

With the high price obtained for cotton during the American Civil War, cultivation in Ceara increased rapidly, so that the yearly crop, that scarcely ever exceeded 1,000,000 kilos before 1864-65, grew steadily every year up to 1871-72, when it reached the record in the century, 8,324,258 kilos. (18,313,367 pounds.)

(Dr. Albano included a table in his paper at this point showing the cotton exported since 1845-46. Only the more recent figures are given because of space limitations, but Dr. Albano advises that the total cotton crop may be calculated to be 150 per cent of the exported cotton. The figures for the ten years 1910 to 1919 inclusive show the average amount of cotton annually exported as 14,213,389 pounds.)

Ceara is one of the most important northeast Brazilian States. It occupies an area of 160,000 square kilometers (64,000 square miles) and has a population of 1,300,000 inhabitants, mostly natives descendants of Indians. The capital, Fortaleza, has 80,000 inhabitants. The chief industries of the State are agriculture and cattle breeding.

The Booth Steamship Co., Ltd., maintains a regular navigation service between Ceara and Europe and North America; other British, Belgian and Italian ships touch sometimes at Fortaleza.

The "Ceara Gas Co.," and the "Ceara Tramway Light & Power Co., Ltd.," (electric) are both British. At Fortaleza there is a branch-office of the "London and Brazilian Bank, Ltd.," agencies of all other important banks and of the "Standard Oil" and "Texas" companies.

There are two railways in Ceara, of one-meter (3 ft. 4 in.) gauge, one from the capital southward to Aurora, the other from the harbor-town Camocim southward to the neighboring state of Piauhy, measuring altogether 932 km. (517 miles) in traffic and 150 km. (83 miles) building.

The country has three distinct regions: the coast (praia), the inland plains (sertao) and the mountains (serra), some of which attain a height of over 800 meters (2,600 feet) above sea-level. The plains rise gradually and at a fairly steep gradient, as they advance inwards.

There are two seasons in Ceara, the rainy, from December or January to June or July, and the dry season in the second half of the year. During the first the rain falls in torrents, the rivers run, the ground is covered with green, the trees don their foliage, life is exuberant on earth and in the air. In the other part of the year the trees and shrubs lose their leaves, the rivers run off quickly on account of the slope of their beds, and nature subsides into lethargy.

The flora of the mountains is quite different from that of the plains and, on account of the dampness and cooler climate, does not lose its leaves in the dry season. In the coastal region some plants also retain their leaves all the year through.

The temperature on the coast is maximum 30 degrees Centigrade (86 degrees F.) minimum 18 (65 degrees F.), on the mountains maximum 28 (82 degrees F.), minimum 15 (59 degrees F.)

Six different species of cotton are grown in the State of Ceara:

(1) *Gossypium hirsutum,* with the popular names algodao herbaceo, caroco branco, pellucho branco. This is an herbaceous, annual plant, attaining not more than two years of age, the first year's crop being much more abundant; it bears fruit in three months, producing 30 per cent of lint; seeds covered with white fuzz; 10,400 seeds weigh one kilo and produce 120 grams of oil; this cotton is much preferred by many, because it produces an abundant crop in a short time, so that the farmer does not wait long for the result of his work and the short vegetative cycle of the plant prevents the attack of diseases; whatever height the plant attains it produces some cotton. I once saw a plant 12 inches high bearing four bolls.

(2) *Gossypium peruvianum,* azuloa, algodao riqueza, caroco verde, pellucho verde. This cotton-plant is semi-arboreous, perennial, attaining 10 years of age, bears fruit in four months, producing 30 per cent of lint, fine, silky, long staple, has its seeds covered with green fuzz, 8,000 seeds weighing one kilo produce 120 grams of oil; this cotton-plant is generally considered by the farmers to be the best, both as regards cultivation or the quality of its staple.

(3) *Gossypium mustelinum,* algodoy, algodao macaco, is a species that tends to disappear, for it only produces a brownish, short and coarse staple; its seed is covered with a brown fuzz; nevertheless, on account of its natural color, this cotton may be of interest to the cotton industry for the manufacture of khaki.

(4) *Gossypium brasiliense,* algodao interio, creoulo, This is a semi-arboreous, perennial cotton, that attains four years of age; bears fruit in six months, producing 25 per cent of lint; seeds black and smooth; adherent in groups of 6 to 9 (kidney-cotton, chain-cotton), occupying each group one of the loculi of the boll; 7,900 seeds weigh one kilo and produce 130 grams of oil; the lint of this species being easily separated by hand; it is preferred by people who do spinning and weaving as a domestic industry.

(5) *Gossypium purpurescens,* algodao quebrado, quebradinho, semi-arboreous, perennial, attaining the age of four years, bearing fruit in six months producing 26 per cent of lint; seeds black and smooth, 7,080 seeds weighing one kilo produce 140 grams of oil; this is a hardy cotton plant and grows well even on poor land.

(6) *Gossypium vitifolium,* algodao Moco, Serido, arboreous, perennial, attaining the age of 20 years, bears fruit in six months, the crop becoming larger after the second year; it produces 36 per cent of fine, silky lint; seeds small, black and smooth, of which 12,560 weigh one kilo and produce 150 grams of oil.

The modern methods of scientific agriculture are unknown in Ceara. The greater part of the cotton is grown by poor and ignorant farmers. Even the more learned farmers prefer the simple, empiric methods of cultivating, although they know that with a little more care and science they would obtain better and larger crops. The plough is all but unknown, the diseases of the cotton-plant are not fought, seed-selection is not adopted and only the saw-gin is used, that breaks and tears the long staples. The roller-gin, specially built for ginning long-staple cottons, is entirely unknown in the State.

In spite of all this, the cotton from northeast Brazil has in the world's cotton market always maintained the third place, inferior only to the best Americans and Egyptians.

Sea Island and Egyptian cottons are the product of

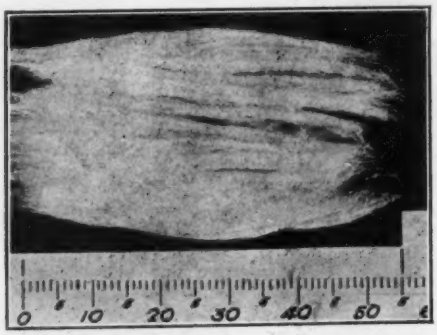
TOP LEFT: INSTALLING THE BOILER PLANT AT PIRANHAS DAM. THESE BOILER PARTS WERE TRANSPORTED APPROXIMATELY 55 MILES FROM THE END OF THE RAILROAD TO THE SITE OF THE DAM. IN THE OVAL: A STREET SCENE IN ICO, A TOWN FIRST SETTLED BY THE ORIGINAL PORTUGUESE PIONEERS. FOR YEARS ALL OF ITS SUPPLIES HAVE BEEN BROUGHT IN BY PACK TRAIN FROM THE COAST. RIGHT CENTER: GENERAL VIEW OF LOCATION OF PIRANHAS DAM WITH CONSTRUCTION CAMP IN THE FOREGROUND. THE STACKS AT THE POWER HOUSE MAY BE SEEN IN LINE WITH THE FACE OF THE CLIFF. LOWER LEFT: LANDING AT FORTALEZA. THERE BEING NO HARBOR AT THIS PORT OF ENTRY, ALL MATERIALS AND EQUIPMENT MUST BE UNLOADED FROM SHIP TO LIGHTERS. LOWER RIGHT: A NOVEL METHOD OF TRANSPORTING COTTON.

many years' selection, are cultivated under scientific methods, grown with utmost care and attention, defended with energy against their pests and diseases, and ginned in special roller-gins.

Mr. Edward C. Green, B. S. M. H., an American, who for some time directed the Brazilian Cotton Service, after calling northeast Brazil the zone of fine cottons, writes:

"Northeast Brazil has the best climate, the best soil, and the best people for cotton cultivation. North America's preponderance in the cotton market shall only last as long as Brazil does not awaken from the torpor in which it lives."

And if northeast Brazil has the best climate, the best soil and the best people for cotton cultivation, it is the Jaguaribe-valley, that has the best climate, the best soil, and the best people in northeast Brazil for cotton growing, for no other region has ever produced so beautiful a staple as one of a sample measuring 55 mm. (2 5/32 inches) which some years ago was taken of some bales of cotton from that valley and given to Mr. Trajano de Medeiros.



COTTON STAPLE 2 5/32 INCHES LONG, GROWN IN THE JAGUARIBE VALLEY, STATE OF CEARA.

It is a fine, strong, silky, long lint, a positive and undeniable proof of the ideal conditions of that region as a cotton growing country.

A similar sample, also grown in the Jaguaribe-valley, was sent last year by Mr. O. Piquet Carneiro, representative of the Industrial Center of Brazil, to Mr. Arno S. Pearse, who at that time was in S. Paulo. Mr. Pearse, in a letter of May 14th, 1921, to Mr. Piquet, wrote the following words:

"You do not mention anything about the excellent sample of cotton you enclosed in your letter. Where was it grown? We must visit that place. Will you send a sample to Dr. W. L. Balls and write a letter that the sample has been sent by me? This is the very cotton I am after. Your sample measures 60 m. m., but take it at 55 m. m."

These are really astounding facts, for never, at no time and in no country since the far-away prechristian times, so long as cotton has been known to mankind, never has a staple measuring 55 m. m. (2 5/32 inches) appeared!

A very important role in the history of cotton is reserved to the valley of the Jaguaribe, the Brazilian Nile!

A British engineer, P. O'Meara, I. C. E., wrote the following:

"About ten miles from the mouth of the river, (Jaguaribe), on its right bank there is a town of regular size called Aracaty, situated on the lower extremity of the rich and vast alluvial plains of the Jaguaribe-valley that extend up country to a distance of about 80 miles, on both sides of the river, with a mean width of 4½ miles, and so plain that in all this distance from Aracaty the land rises only about 50 meters above sea-level. It is evident that if there was a good and regular water-supply along this valley, at convenient levels for irrigation, it would rapidly become an important and profitable center of production, having in its favor great advantages, such as a rich soil, a good climate, a numerous hard-working population, and a small distance to a convenient port."

The scientists who have visited this valley all confirm these opinions about the high fertility and the excellence of these lands. The only drawback on agriculture in northeast Brazil is the periodical drought already mentioned.

Irrigation is the only solution to this problem. And in Ceara there are splendid sites for reservoirs and excellent irrigable land.

The Brazilian Government, carrying out a big irrigation scheme in the State of Ceara, has contracted with the American firm of Dwight P. Robinson & Co., Inc., and with the British firm of Norton Griffiths & Co., Ltd., for the construction of large dams.

These reservoirs, with a total capacity of 4,331,947,200 cubic meters (3,530,453 acre feet) will bring under water 145,000 hectares (362,500 acres) of the most excellent fertile land, capable of producing the finest cotton in the world.

On irrigated land two crops can be grown yearly, one during the rainy season, the other by irrigating in the dry season.

The average yield of cotton per acre in North America is 250 pounds of lint, in Egypt 414 pounds, in the Sudan 126 pounds, and in India 100 pounds.

In Ceara, under the already described empiric methods of cultivating and marketing, the yield of cotton per hectare is from 400 to 780 kilos (355 to 693 pounds per acre) of lint.

It is certainly not exaggeration to calculate a yield of 1,000 kilos of lint per hectare (900 pounds per acre) for the fertile valleys of Ceara, if irrigation and modern methods of cultivating, handling and marketing are adopted.

In conclusion, northeast Brazil is able to produce good long-staple cotton, and the valley of the Jaguaribe, the Brazilian Nile, can produce in large quantities cotton superior to Sea Island, as soon as up-to-date appliances are introduced. "The best climate, the best soil, and the best people are there for cotton cultivation." The only things needed are capital and scientific direction.

H. Gardner McKerrow, who for three years was the advertising manager of National Aniline & Chemical Co., Inc., has become associated with Supply and Demand, a new merchandising and advertising service, with offices at 1823 Broadway, New York City. This organization was formed to act as specialists in merchandising and advertising problems for textile mills. It is emphasized that the firm is not an advertising agency, and that they do not accept commission for space bought from publishers. The organization's staff includes experts in the mill, jobbing, cutting up and retail branches of the industry, and each problem is studied and recommendations made with regard to the campaign plan, including advertising, direct mail, follow-up letters, or any other form of activity. A fee is charged for the service rendered. Some textile advertisers, states Mr. McKerrow, while building up consumer interest, do not fully appreciate the importance of tieing this up with the jobbing and cutting-up interests, thereby failing to secure the full value of their expenditure. The copy service on textiles is prepared with an understanding of the structure, finish and uses of the fabrics under consideration.

Mr. McKerrow's many friends in the industry will be interested to learn of his new connection.

New Models for Cotton Warehouses

BY C. MORAN.

How many cotton warehouses in the United States enjoy the minimum fire insurance rate of 20 cents per $100 of value for a three-year period? They are few and far between, according to warehouse experts of the United States Department of Agriculture. These Federal officials say that of the 3,000 cotton warehouses throughout the South fully 90 per cent pay fire insurance rates of 50 cents to $3 per $100 of value per annum.

The Department of Agriculture has studied the cotton warehousing situation a number of years. It knows that because of lack of an efficient warehousing system virtually the entire cotton crop is sold within four months. It

ONE-STORY BRICK WAREHOUSE AT DILLON, S. C. A TYPE OF FIREPROOF CONSTRUCTION.

knows that the country damage to cotton approximates $50,000,000 annually. It knows that millions of dollars each year are paid in fire insurance rates because of faulty construction of the majority of the warehouses in use. Many of the buildings are a tremendous fire hazard. Literally, they are tinder boxes, susceptible of complete destruction in the event of fire.

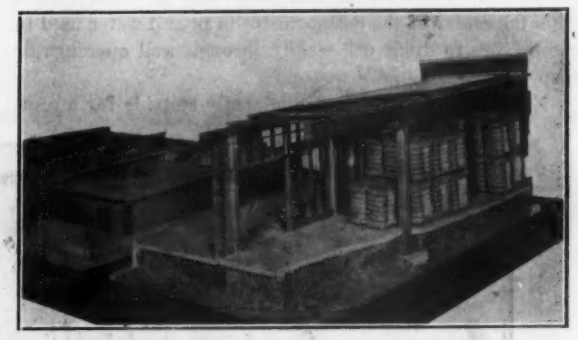
Models of cotton warehouses that embrace every known feature of efficient operation and protection from fire have been designed by the Department's warehouse men. The types include a one-story warehouse with wood-end walls, one-story buildings of both brick and concrete, and a four-story building of reinforced concrete. During the past year these models have been exhibited to more than 4,000,000 people at state fairs and agricultural colleges, and have served as models in the recent construction of several commercial warehouses in the South.

At Dillon, S. C., the Dillon County Warehouse and Market Company recently constructed a five-compartment, one-story brick warehouse of 5,000 bales capacity. The building is of fireproof construction throughout and will be equipped with sprinkler systems. At Dunn, N. C., the General Utilities Company has built a two-story warehouse of brick construction with 10,000 bales capacity. The capacity of the building can be doubled if necessary. These structures follow the Federal models and pay low insurance rates.

The compartment is the unit of construction. Fire is thereby confined to a single compartment and prevented from spreading throughout the buildings. The size of the compartment is limited to about 600 bales capacity, depending upon factors such as economy of cotton handling, cost of construction, ability to withstand fire and to permit effective use of sprinklers, hose streams and hand appliances. Each compartment has a length of approximately 100 feet between exterior walls and is sufficiently high to give a minimum of 18 inches between the surface of the stored bales and the under side of the overhead beams.

Of the models the fire-resistive or reinforced concrete type ranks first in protection against fire and in low cost of maintenance and depreciation charges. But because of high construction cost this type is recommended principally for warehouses more than one story high. It should be used in one-story buildings only where the structure is badly congested or severly exposed. For single-story warehouses the best design of slow-burning or brick construction is both economical and adequately fire-resistent.

In the one-story buildings as many compartment units may be added as the business requires. The doors at the front and back of each compartment are located so as to provide a continuous passageway through the building for trucking. There are also concrete loading and unloading platforms at the front and rear. Sprinkler systems are provided throughout in addition to yard hydrants. Chemical extinguishers are an additional safeguard but it is pointed out that they should not provide the only protection. For the three-story buildings stand pipes are also

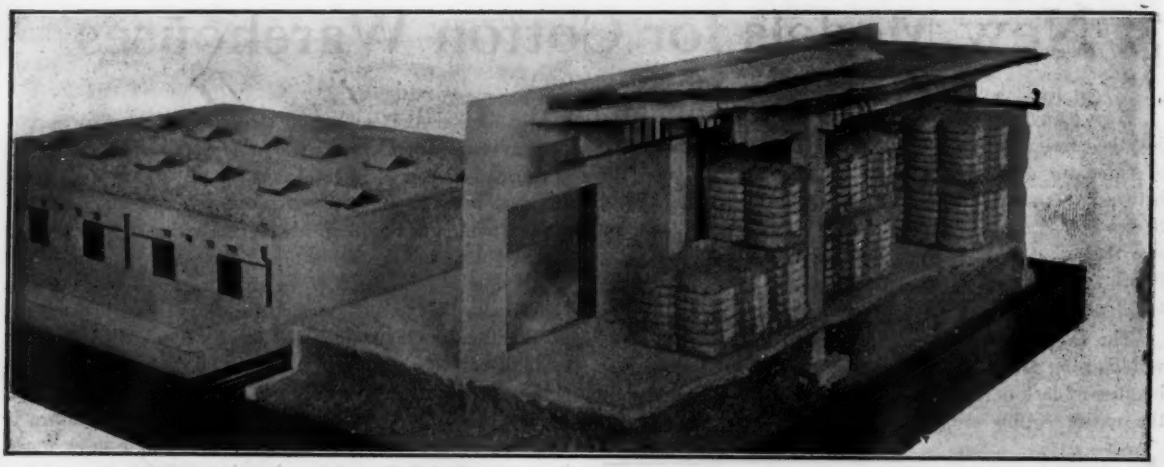


SECTIONAL VIEW OF ONE-STORY, THREE SECTION WAREHOUSE WITH WOODEN END WALLS.

used. Adequate protection against lightning and a signaling device for fire alarms are also provided.

The main construction features of both brick and concrete buildings are the division fire walls, exterior walls, roof, floors and openings. The concrete warehouse will resist fire both inside and outside the building. The division fire walls extend from a firm foundation of concrete to the under side of the roof. These walls are 16 inches thick, depending on length, height, and the number of stories in the building. Openings in the walls are protected with fireproof doors that close automatically at 160 degrees F.

The exterior walls are of a non-combustible material such as brick, concrete, stone or sand lime. Windows in these walls are of steel sash, glazed with wire glass. In single story warehouses light may be furnished through skylights. The advantage of having windows in the walls is that they afford openings through which hose streams may be effectively discharged, although doors usually supply this need.



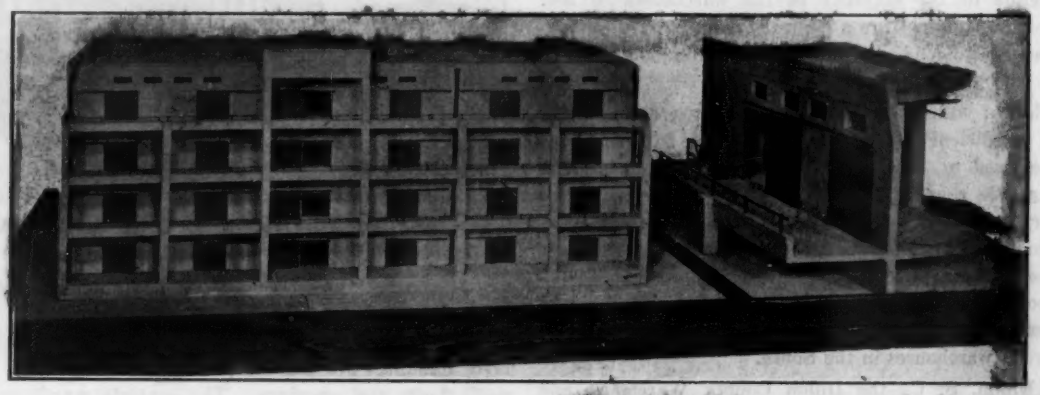
REINFORCED CONCRETE WAREHOUSE AND A SECTIONAL VIEW SHOWING CONSTRUCTION.

Doorways in the exterior walls are of a size and location convenient to operation. Sliding doors made of three layers of wood covered with tin on both sides are used. A wide door affords convenience in trucking. In compresses practically the whole wall is composed of steel doors that roll up. The first or ground floor rests directly on the ground and is of a non-combustible material. Cement pavement gives best results as it may be easily trucked over, does not deteriorate, and is inexpensive. The important consideration is to keep out moisture. Upper floors are of fire-resistive construction and built with a slight incline from the center of the compartment to permit water used in case of fire to drain off readily through wall openings or scuppers.

Reinforced concrete is preeminently suitable for a roof. Various types of reinforced concrete floor and roof construction are a flat concrete slab supported by columns with large flaring heads, the beam system which consists of beams at intervals supporting relatively thin slabs of concrete, and a combination of concrete beams and hollow tile. Ventilators and skylight openings in the roof are of metal and designed to prevent entrance of sparks from the outside. In the compress compartment, revolving cowl ventilators are used.

Platforms connected with the warehouses are of reinforced concrete and 10 to 20 feet wide. A top dressing or surfacing of concrete mixed with cement is used to prevent rapid wearing. For trucking, two-wheel trucks are used. The larger plants are now using electric storage battery trucks or tractors with trailers. These trucks or tractors can be used inside the storage compartments without danger of fire. Several large warehouses also use overhead trolley systems, but this is not recommended for the average warehouse.

Elevating equipment is usually needed in warehouses of several stories. This is either an inclined sprocket chain with hooks that engage the axle of the truck, an electric hoist, elevators, or belt conveyors. To lower the cotton an ordinary spiral or straight package chute is used. To pile the cotton, there is a small portable elevator. Scales in general use for weighing are the ordinary beam scale, the portable platform beam scale, and the dial scale.



A CONCRETE COTTON WAREHOUSE OF THIS TYPE IS OWNED BY THE SHIPPERS WAREHOUSE & COMPRESS CO., AT DALLAS, TEXAS.

A building of good brick construction will retard materially the action of fire and provide favorable conditions for putting it out. Construction consists of substantial masonry walls and heavy timber framing, with thick and closely laid floors and roof, all arranged so that no concealed spaces or air pockets are formed. Timbers are supported at the end walls so that should they fall they will not damage the walls. An important feature is walls that will not overturn or buckle from heat.

The roof and floor timbers are supported by the division fire walls and rest freely on a ledge. Thick planking for

(*Continued on page* 270.)

COTTON GROWING POSSIBILITIES IN ARGENTINA

BY M.T.MEADOWS

Copyright by Underwood & Underwood.

There is but a limited number of American cotton men who realize that the Argentine Republic offers to cotton planters and colonization enterprises, looking for an opportunity to go into the cotton business on a large scale, a potential cotton belt, which if taken in connection with lands in Paraguay and Bolivia, is fully as large as that of the United States. This vast territory, endowed by nature with a rich soil, blessed with a benign climate and healthful living conditions, is still hardly more than a virgin state, despite the fact that most of it lies within easy reach of Buenos Aires and world markets by river traffic on the Parana and Urguay, as also over the expanding railway system which handles freight and passenger transportation between the growing trade centers now fast springing up.

Although cotton growing as a commercial enterprise is, comparatively speaking, a new development in Northern Argentina, yet the plant itself has been native to this region from time out of mind. Indeed the Spanish conquistadors who first visited Northern Argentina almost four centuries ago found that the Indians had acquired great skill in the manufacture of coarse cotton cloths from the staple which grew wild in surprising abundance. Many references are made in the annals of the old Spanish chroniclers relative to the methods employed by the Indians in making these cloths which were staple articles of native manufacture and barter and which, picturesquely dyed with vegetable colors, were much admired by the earliest whites to visit the region.

Today, however, the growing of cotton in commercial quantities in Argentina is limited to the following Provinces and Territories:

Argentine Cotton Belt	Area Sq. Miles	Population	Acreage 1919	Acreage 1920
Corrientes	34,771	325,000	12,500	12,500
Chaco	54,654	27,394	25,000	62,500
Formosa	42,903	15,216	100	250
Misiones	9,128	44,745	1,000	2,500
Total	141.456	412.355	38.600	77,750

In further explanation of the foregoing figures it must be said that in all probability the statistics, secured from the Department of Agriculture, are rather incomplete, for, since cotton is an insignificant Argentine crop in comparison with wheat, corn, linseed, etc., data relative to it is likely to be slighted by the authorities. Moreover as it is a new crop being experimented with in many out-of-way sections of the northern Provinces, reports from outlying districts are hardly to be secured and the figures are based upon statements received from only those districts where cotton has already been cultivated in commercial quantities. It is likely that 90,000 acres is nearer the proper estimate for 1920. Due to the slump in world cotton values it is probable that the 1920 acreage was not greatly increased in 1921 and 1922; although official figures have not yet been published. For the next three or four years there will perhaps be an increase in acreage of about 25 per cent per

annum. This however will depend largely upon the rate at which immigration into the country takes place, and also on the world demand for cotton and the prices paid.

Two of the most significant signs of progress are represented by the interest shown in the cotton situation by the "Compania General de Forforos" and Hugo Stinnes. The Compania General de Fosforos has a practical monopoly on the manufacture of matches in Argentina. The stem of the match manufactured by them is made of waxed cotton yarn and the Company contracts to purchase at a stipulated price all the cotton which planters are able to produce. The increased yearly production in match stems of this company alone is capable of absorbing all increases in cotton acreage likely to be planted in the course of the next decade. According to reports in the Buenos Aires press Hugo Stinnes, the coal, iron, newspaper and shipping king of Germany, is planning to acquire large holdings of land in the Province of Corrientes for the purpose of colonizing this territory with German immigrants who will undertake the cultivation of cotton on a large scale.

It must be said in passing that if the region mentioned above is not all that is needed for expansion purposes, the Provinces of Salta, La Rioja, Santiago del Estero, Jujuy, Catamarca and Tucuman are at hand; however, these hinterland Provinces, though possessing soils and climate admirably adapted to cotton growing, are nevertheless handicapped by the lack of cheap transportation to sea-bound or river ports. Fortunately a new era in railroad construction in Argentina is now being ushered in and it is logical to assume that in years to come this rich cotton belt will have a system of railways which may compare favorably with that extending today throughout the more densely populated grain growing districts. Moreover it is to be expected that with the growth of the volume of traffic handled, railroad rates per ton mile will be gradually reduced and consequently the problem of transportation will largely be solved. At all odds, taking this additional territory into consideration, the Argentine cotton belt receives 219,600 more square miles, giving us a sum total of 361 056 square miles. Hundreds of thousands of square miles of land capable of growing cotton are to be found in the neighboring republics of Bolivia and Paraguay and in so far as the development of a future cotton empire in this section of South America is concerned the Republics of Argentina, Paraguay and Bolivia may be taken as forming one domain.

To those observers who have studied the world cotton situation it is hard to understand why this vast extent of territory has not already attracted the attention of capitalists interested in cotton; its latent possibilities have been realized by experts for more than half a century. Howbeit, the future development of the cotton industry must take this region into consideration since its possibilities are far too great to admit of a permanent oversight. It is true that at present the two principal factors, labor and capital, are lacking in the required magnitude. However the start has been made. Undoubtedly a reasonable portion of the great wave of immigration into Argentina may be diverted to the northern provinces where cotton is grown and likewise more and more Argentine capital is becoming educated to the possibilities for profitable investment offered by cotton. It is also to be expected that gradually a certain amount of foreign capital may be interested in this field. Once these probabilities are turned into realities the Argentine cotton belt should become one of the largest centers of production of this staple.

Experiments covering a certain period of years have conclusively proven that cotton can be profitably grown in Argentina as far as the 24° South Latitude; but without doubt the most favorable region in which to develop this industry on a large scale is that bordering the Parana river in the Provinces of Entre Rios, Santa Fe, and Corrientes as well as in the National Territories of Chaco, Formosa and Misiones. At present the center of the Argentine cotton industry is located at Resistencia (Chaco), but owing to the greater abundance of labor in the Province of Corrientes it is likely that Corrientes, within a few years, will assume the leadership in cotton production.

Broadly speaking the entire potential cotton regions of Argentina are exceedingly fertile and are admirably adapted to cotton growing on account of favorable climate and abundant rainfall. The soils of these regions are mostly made up of sand and clay loams. However, the physical as well as the chemical composition of these soils, varies widely from one district to another, as do soil depths also. Naturally it will be understood that these regions are not only suitable for cotton but will grow a variety of other crops which permit of the widest possible range of crop rotation. In general the lay of the land is everywhere adapted to agriculture being for the most part rolling plains dotted with open spaces and dense forests. That these regions are especially well suited to cotton is no longer a matter of conjecture on the part of experts but is a well established fact amply borne out by the success already attained in Corrientes, Chaco, Missiones and Salta.

Taking the Parana-Paraguay river system as our dividing line it may be said that to the west rainfall averages from 50 to 30 inches, while towards the east the average is from 50 to 40 inches. Further to the west, where the rainfall is less than 30 inches, irrigation becomes necessary. However, land already under irrigation sells at fancy prices and additional water for irrigation purposes is scarce. Fortunately there is such an abundance of good land having sufficient rainfall that for many generations to come irrigated land will not be required.

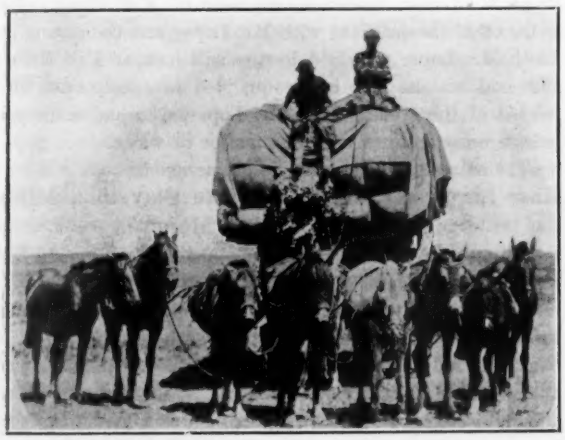
The work of adapting a number of varieties of cotton to Argentine soil and climate conditions has already been successfully undertaken. The greatest efforts along this line have developed the "Chaco" cotton, a type originating in the Chaco territory. On account of the splendid results obtained from planting this variety, "Chaco" cotton may be safely taken as the basis for the development of the future Argentine industry. A type of cotton called "Hanita," derived from planting of long staple upland cotton brought from Georgia, has been thoroughly acclimated and is giving splendid results. As far back as 1903 samples of Argentine cotton were submitted to experts in New York, Liverpool, Bremen and Barcelona.

It is difficult to say just how much cotton could be grown per acre on some of the best Argentine lands during a good crop year, were scientific methods of cultivation employed. Practically all cotton planters in Argentina are European immigrants who are not familiar with cotton growing and for this reason results are not what could be expected from experienced farmers. Limiting ourselves strictly to what is now being accomplished we must say that on the whole

Argentine growers take from one half to three quarters of a bale per acre.

Happily the Argentine cotton planter has not as yet been called upon to face the ravages of the boll weevil. At present there is only one plague which attacks the crop in this country; namely, a cotton worm which may be destroyed by a liberal application of Paris green. Very strict measures are now in force in order to prevent the introduction of the boll weevil into the country and consequently it is a very difficult matter indeed to get foreign cotton seed past the customshouse authorities.

Perhaps the greatest single handicap to the development of Argentina's cotton industry is the lack of labor throughout the potential cotton belt. Chaco planters today are almost exclusively dependent upon the Indians for the bulk of their labor; when these have been called away to neighboring sugar mills or quebracho extract factories the planters are in a real predicament. The greatest losses due



International News Reel Corp.
TRANSPORTING COTTON IN ARGENTINA.

to the scarcity of labor occur during the picking season for, owing to the abundance of uncultivated land, farmers are apt to overplant and consequently when picking times rolls round they are not able to secure sufficient hands for gathering the crop. The Indian labor now available is of course very cheap but unfortunately the workers are most irregular and sometimes abandon the field in a body at the order of some "cacique" (chieftain) whose displeasure the planter may have incurred. On the other side of the river Parana in the Province of Corrientes cotton planters are more fortunate in the question of labor for there is an abundant supply of peons who make excellent agricultural laborers and in all probability it is to this Province we must look for the greatest progress during the next decade.

To the planters of the Chaco territory the question of freight rates is one of prime importance, for up to the present time no modern compresses have been erected, and the bales must be shipped to Buenos Aires just as they come from the country gins. Under this system the freight rate from Resistencia (Chaco), center of the present day cotton industry, to Buenos Aires is approximately $5.00 per bale.

At present the Argentine Government is not lending any direct aid to cotton growers other than the establishment of experimental stations in various sections of the cotton belt. The National Bank (Banco de la Nacion Argentina), however, offers aid to cotton growers just as it does to grain farmers and cattle raisers. On the whole the greatest assistance can be expected by the small farmers from such large companies as the Compania General de Fosforos and La Hilanderia Argentina both of which are striving to promote cotton production. No doubt, in time as the cotton industry here gains ground it will be possible to secure aid from the National authorities through the placing of a heavy protective tariff on raw cotton, cotton yarns and cotton goods in order to stimulate the growth of every branch of this infant Argentine industry.

If the growing of cotton in Argentina is still practiced along primitive lines, the ginning system is even more primitive. As operations are carried out in the Chaco at present, ginners practically control the entire output since they contract to purchase the entire crop and to supply the planter with necessary funds for living and planting expenses throughout the growing season. Moreover the ginners hold the whip hand for if the farmer refuses to sell to them his cotton is left in the seed. In the Chaco Territory there are now some twenty ginning establishments. Two of these are fairly modern plants belonging to two large companies. Nevertheless the majority of the gins belong to merchants who buy seed cotton from the planters and sell it to Argentine exporters and mill owners located principally in Buenos Aires and Rosario.

In Corrientes the industry is even more rudimentary than in the Chaco and throughout the entire Province there is not one up-to-date ginning outfit to be found. However there are three small ones which belong to local merchants.

Up to a few years ago cotton seeds were thrown away as a waste product or burnt as fuel. Of late years several cot-

International News Reel Corp.
UNLOADING THE WAGON—ARGENTINA.

ton seed oil mills have been established in Resistencia and in Buenos Aires but up to the present time these have not been able to produce a highly satisfactory quality of refined oil. Improvements are gradually being made in these plants and at present the Compania General de Forforos is erecting a large crushing plant as well as installing the machinery for refining the crude oil. The cottonseed meal produced is exported, principally to Denmark and Holland. No doubt as Argentina further develops as a great dairy country and pasturage becomes less abundant a home market for all meal production will spring up. Cotton seed hulls find no sale in the country and the cost of freight to overseas' markets prevents their exportation.

Several cotton spinning and weaving mills are now operated in Buenos Aires. All of these use a certain

amount of local cotton but since a sufficient variety of all types of cotton is not produced for all grades of yarns desired some raw cotton is still being imported. However, all the cotton consumed for surgical purposes and other uses is of Argentine production. Due to the uniformity of the type of Argentine cotton its employment offers certain difficulties; for instance, it is too good a cotton to be used in the coarser grades of cloth and it is not good enough to be used in some of the finer sorts.

At present practically all of the Argentine cotton exported goes to Barcelona, since Spain has for many years shown the greatest interest in the purchase of the Argentine crop. What few shipments have been made to Liverpool were sold without any particular difficulty. A small quantity of cotton is shipped to Uruguay but over 75 per cent of the home crop is consumed by domestic industries.

Northern Textile Operating Executives Have Practical Discussion at Fall River

REPORTED BY JAMES ROBERTSON

It was the writer's pleasure to be present at the first sectional or departmental discussion meeting held by the Southern Textile Association in Charlotte, N. C., in December, 1920, and to see inaugurated those series of meetings that have proved so beneficial to the southern textile operating executives. It was also my opportunity and pleasure to attend the second meeting of the New England Operating Executives held under the auspices of the Associated Industries of Massachusetts, in Fall River, Mass., on December 5th.

This meeting was held at the Bradford-Durfee Textile School in the heart of the city of Fall River, and certainly the meeting went through with an enthusiasm that showed no reticence on the part of the audience to seek further information from the lecturer on his subject, even after he had finished his talk. So great was the demand for admittance at this meeting that it was necessary to issue tickets limiting those admitted to the capacity of the hall. There was not a vacant seat to be seen at the beginning of the lecture.

Henry W. Nichols, principal of Bradford-Durfee, was in charge of the meeting, and made the opening address welcoming the audience to these meetings and expressing a desire that everyone would continue to show the same interest and enthusiasm as had been exhibited at the first meeting, and that the men would carry something of real value away with them. He next spoke of Mr. Quimby, who had organized the meetings under the auspices of the Associated Industries of Massachusetts and who had liked Fall River so well that he had decided to make it his home and headquarters.

Mr. Stetson, as a representative of the Associated Industries, was then introduced to the audience. Mr. Stetson said in substance, "You are doing here, in this room, what the association is working so hard to do throughout the state, that is, to get everybody to understand his job in a broader sense; to understand a little better those who are working at the same job; and to get together and exchange experiences and ideas so that all of us will grow and be better at our jobs from these exchanges. We know that more and more as the years advance the individual amounts to less and less and that more and more we are dependent upon others in order that we may be successful. We can't know too much about our job and the only way we can know about our job is to know what other men know about that same job. We must have, as near as we can, a perfect knowledge, that we may cooperate, work together, and get the best and highest results. I don't think there is any doubt in the minds of you men here of the value of cooperation and that is what the Associated Industries of Massachusetts stands for."

Mr. Nichols then introduced the speaker of the evening, Ralph E. Loper, industrial engineer of Fall River. He spoke of his associations with Mr. Loper and the esteem in which Mr. Loper was held by the mill men of Fall River, and said no one was better qualified to speak upon the subject of the evening than Mr. Loper, who had made extensive investigations upon the matter of waste.

The subject of the evening's discussion was

How Large a Part Does Waste Play in a Mill's Making or Losing Money?

and Mr. Loper made the following remarks on this subject to a "crowded house."

"Nearly everyone gathered here tonight is directly interested in cotton mill operation. Therefore the term 'waste' usually suggests to each of us the waste-house and the materials taken from there by the waste dealers. When this subject of waste was assigned, I was told that it is to be used in its broader sense; that waste is intended here to include all avoidable losses. It may be defined as the difference between the actual quantity used and the actual quantity required. It may be human energy, time, equipment, power, supplies or material.

"There are three logical steps in taking up this problem: The first is to recognize the waste and appreciate the relative importance of the loss; second, to locate the cause of the waste; and third, to find and apply the remedy. Tonight we shall consider together some of the principal kinds of waste and I shall endeavor to indicate the extent to which some of these may affect the profits of a textile mill. If the discussion which follows should lead any of you to think out the second and third steps for your own mills, then this evening together will have been well spent.

"Since cotton makes up about half the cost of plain goods, it is an important item and deserves very careful attention. In fact, almost any mill using 100 bales of cotton a week can well afford to have an employee devote his whole time to the grading and stapling of the cotton, following-up claims for short weights, excess tare, etc., selecting the marks which shall be used together in the cotton mixing, and in following-up the waste from each process.

"Each superintendent must decide just how far it will pay his mill to rework the waste. Some prefer to sell No. 1 card strips—others will rework them for coarser counts. Some will rework spinners' waste while others do not think

it pays. Of course the easiest thing for any mill to do is to sell all its waste and use nothing but new cotton. The easiest way, however, is not often the best way and almost any superintendent who will devote a little study to the matter can find a more profitable solution. 'Where there's a will, there's a way,' and it is surprising to see how many ingenious and practical ways the overseers can suggest to prevent the making of waste and to use what would ordinarily go into waste when they are once thoroughly interested in this subject.

"In any campaign of this sort, one must be satisfied with an honest effort to reduce waste and not be unreasonable in the matter because it is too easy to carry waste out in dinner pails, pockets, etc.

"The proper control of humidity has an important influence upon the amount of waste made and especially upon the invisible waste. Cotton as normally purchased by the mills contains about eight per cent of natural moisture. This moisture is essential for the proper working of the cotton, since the fiber loses a part of its strength when this moisture is removed. While this fact is a matter of general knowledge it is fairly common to find mills which ignore it. Some tests made in a southern mill some time ago showed that cloth when weighed before baling contained only about four per cent moisture. Until then the management had been puzzled to know why they had such a high invisible waste. One could spend a whole evening discussing this phase of the waste problem but there are other points to be considered so we shall just check up to see what influence waste of cotton may have upon the profits.

"Between mills which use different grades of cotton one must expect considerable variation in the amounts of waste. This is fully made up many times by the lower price paid for the cotton. To determine to what extent care in management can control the waste of cotton I have chosen mills using similar cotton, in fact in some cases the cotton was bought from one buyer and was identical for two or more mills on similar fabrics. From a study of such results it is conservative to say that the net waste from the same cotton would vary as much as four per cent under different managements.

"Spot cotton has recently been quoted at over 25 cents per pound, and most print cloth mills must pay a premium above this to obtain cotton they can spin. When cotton sells for 25 cents a pound, four per cent lower net waste will increase the profit of the mill by more than one cent on each pound of cloth sold.

GIVING AWAY COTTON.

"Closely connected with the loss from excessive waste of cotton during manufacture is the loss which comes from giving away cotton in cloth that is heavier than the standard weight. No one knows better than you men how difficult it is to make yarns and cloth to standard weights. Cloth contracts allow for this by permitting a variation of several points above or below the standard, but in a print cloth mill most factors operate to keep the cloth too heavy.

"If the yarns are heavy the spinning runs better. Since such yarns are stronger the weaving runs better. It is, therefore, easier to make goods heavier than the standard and buyers never complain when they get such goods. The result is that unless the management is constantly on the alert certain styles will be heavy. It is not uncommon to find such cloth averages five per cent heavier than standard. With cotton selling at 25 cents per pound this would represent a net loss to the mill of about 1¼ cents per pound of cloth. Putting it another way, the overseer of spinning in a medium-sized print mill, who allows his yarns to average one-half a number heavy, is wasting for the mill over five times as much as his own salary.

WHERE THE PROFITS GO.

"If you will take the trouble to investigate the matter you will find that in nearly all of those mills which are consistently successful the superintendent and overseers feel that the agent scrutinizes expenditures for current supplies a little too closely. It is difficult to impress upon the employees the importance of economy in the use of supplies, yet their cooperation is essential because they are the ones who use most of the supplies. Waste of supplies and spoiled goods have a very direct effect upon the profit of a textile plant during periods such as we have just seen. Assuming a profit of ⅛ cent per yard (profits have been much less than this in many plants this year) I have worked out several typical illustrations.

"When a weaver makes a cut of seconds the mill loses the profit on four cuts of cloth. When he smashes a shuttle the mill has lost the profit on all the cloth that loom can weave in a month. When a loom fixer splits a picker stick the mill loses the profit on two cuts of print cloth. If he spoils a reed the profit is lost on all the cloth that loom can weave in over five weeks. If a warp is damaged and has to be redrawn the mill loses the profit on over 15 cuts of print cloth. If a spinner spoils one roll the mill loses the profit on a cut of cloth. If he breaks an electric lamp bulb the mill loses the profit on five cuts of cloth. If a machinist does one hour overtime work unnecessarily, the mill loses the profit on six cuts of cloth. If the fireman saves one wheelbarrow of coal the mill gains the profit on 14 cuts of cloth, but if they allow steam pressure to drop and the engine is stopped 15 minutes then a mill of 100,000 spindles would lose the profit on over 20 bales of cloth.

"Little economies of this sort when multiplied by several hundred workers will have an important effect upon the profits of the average textile plant.

WASTE FROM FAILURE TO USE MODERN METHODS.

"There was a time when the introduction of improved methods and more modern machinery was opposed by labor organizations. The strenuous opposition of the Lancashire weavers to the introduction of the power loom is a prominent example. This was largely due to the fear of the weavers that they would be deprived of a means of earning a livelihood; but this fear was unfounded for while the number of weavers in Lancashire in 1840 was approximately 5,000, the number at present is over 270,000. Such examples as this have taught most of us the great value to all concerned of economical production, and today there is seldom any opposition on the part of organized labor to the introduction of modern machines.

"There remain, however, not a few instances where waste exists because mills are using methods which are out-of-date and have been discarded by competitors. Not infrequently this condition could be corrected with very slight expenditure if the management was aware of the improvements and had time to apply them.

"Experience is a valuable teacher, but no man should

be contented to profit only by his own experience. He should keep closely in touch with the improvements in his industry and should encourage his employees to read regularly the best trade papers, and to visit the textile exhibitions whenever possible.

"The making of accurate tests or special studies inside a cotton mill where everyone is pushing for production is not easy. Here in this building you have laboratory facilities which could be easily availed of for many of your studies. Some mills have already profited by these opportunities, but more should do so. Very often it will be found that the results of such tests, made under known conditions, are much more conclusive than those made under the usual conditions found in a manufacturing plant.

"A very good example of this occurred when a new type of spinning ring was being tried out. The inventor claimed that the 1¾-inch rings of the new form would spin as well as the regular 1⅝-inch rings, thus saving doffing expense, etc. One frame had been equipped as a test and had been running in the mills several months. Each time the overseer and superintendent inquired, the reports from the spinner and second hand were favorable, so they had about decided to place an initial order for several thousand rings. Before doing so, however, instructions were given to have the results verified by a special study.

"Two adjacent frames running the same counts from the same roving at the same speeds were taken for the test. The study was of the very simplest kind and required only an ordinary watch, a pad of paper and a pencil. During seven hours the number of breaks on each frame was carefully recorded by an observer and when at the end of that time, the results were totaled, the overseer was hardly able to believe the figures because the 1¾-inch ring showed nearly 2 1/3 times as many breaks as the 1⅝-inch ring. A shorter study made soon after to satisfy the ring maker verified the original conclusion and the order was not placed. The point which impressed the superintendent was that a special study in seven hours had conclusively proven facts which had not been discovered by running the frame during several months. The reason why this could happen when everyone was really trying to learn the truth was that both frames ran comparatively well, there were few ends down, even on the 1¾-inch rings, and the spinner had not noticed the extra work caused by one frame. The truth of the matter would have been quite evident, however, if the whole room had been changed over to the new rings.

"It is difficult to express accurately in cents per pound of cloth the amount which could be eliminated in some mills by the adoption of more modern methods and the use of research facilities at their disposal, but it would be a worthwhile saving and should not be overlooked in our discussion tonight.

WASTE FROM CURTAILMENT OR LOW PRODUCTION.

"In cotton mills a large part of their expenses and much of the labor cost are fixed and go on at the same rate per week regardless of whether production is higher or lower. Even when the mill closes completely, retaining only necessary watchmen, etc., taxes and insurance must be paid and many other items of expense must be met. A considerable waste, therefore, exists during curtailment, amounting in print cloth mills to more than five cents per pound of normal product. Even at that there have been times when the mills lost more by operating than by curtailing. Such conditions are due to causes beyond our control so we shall not dwell upon the subject tonight.

"Since so much of the cost to operate a cotton mill is fixed regardless of production, it is evident that there is a loss when a mill operates with low production. Leaving old machinery out of consideration, it is safe to say that among mills making similar products the front spinning roll speed will differ by more than ten per cent and that the pounds per loom week on the same style of cloth will differ by more than ten per cent. This has a very important bearing upon the profits, because any print mill in Massachusetts which will increase its production seven per cent through greater efficiency will reduce its manufacturing costs over one cent per pound of cloth.

WASTE OF HUMAN ENERGY.

"Closely connected with the foregoing loss is the waste of human energy under working conditions usually found in the plant with low production. The fatigue of textile workers is often much less affected by the amount of their production than by their working conditions and the quality of materials supplied them. A loom requires very little attention from the weaver while it is producing, but as soon as it stops his work begins. The oftener it stops the harder the weaver must work and the less his production and pay become. The same condition occurs in the spinning room, and again in the card room. The fly frames produce most when the operator can sit for an hour or more at the end of the alley and watch the frames run. With this in mind it is easy to understand why good running work is so effective in holding desirable help.

"There is a greater difference than most people realize between what a good workman surrounded by proper conditions can do and what the average workman does. The most profitable workers for a textile mill to have are those who can earn good wages and who will leave if repeatedly prevented, by conditions beyond their control, from earning full wages. The only way to keep these profitable workmen is to make it possible for them to earn more money than they can get in other plants. This does not mean pay higher piece rates than competitors pay, but have conditions right so that the workers can do their best. Some managers fail to realize the importance of providing the best conditions and instead are paying higher piece rates than their competitors, yet their workers are discontented and change often.

"An example of this came to my attention recently in connection with winding dark colored wool yarn. The winder tenders had been receiving $14 per week, day pay, and the labor cost to the mill had been about five cents per pound of yarn wound. It had been difficult to get girls for $14 per week so the superintendent decided to look into the possibility of piece work. He soon discovered that the light was very poor and corrected this before setting his rates. When conditions were right a rate of two cents per pound was adopted and the girls were able to earn $20 per week instead of $14 as formerly.

"There are many different phases to this loss by waste of human energy or by failure to develop the full possi-

bility of the men in your employ. Last month you spent all of one evening discussing industrial accidents which have a direct bearing upon the waste of man power. It is a serious thing for the man and the mill to have him injured and unable to work for a month. It is a much more serious loss to both if during the other eleven months of the year he is working under a handicap because of poor working conditions, lack of training or proper direction or because he is not given the proper incentive to do his best.

"When all points are considered it is probably safe to say that the human element is the most important feature in the operation of a textile mill. The successful superintendents are those who can best lead men, because, with their group of loyal and interested employees, they can solve the manufacturing problems and keep the wastes at a minimum.

WASTE IN THE OFFICE.

"Until now we have considered only the losses which occur inside the mill, but the office can cause serious waste by selling styles of cloth not well suited to the mill, or by selling styles which give a lower margin of profit than others they might have chosen.

"Those selling the products of textile plants frequently contend that they do not set the selling prices but instead are obliged to accept the market. It is quite true that gray goods mills seldom have the chance to set their own prices, but they do have a chance to choose their styles in most markets. In many cases there is a real opportunity to increase the profits by wisely choosing the constructions to make.

"That such opportunity exists for mills making the commonest kinds of plain cloth can be shown by comparing the prices during the past ten years for standard prints, tobacco cloths, sheetings, shirtings, poplins, crepes, and other similar weaves. One finds that goods on which the market prices per pound are within one cent of each other at times will differ by several cents per pound at other times for periods of over a year.

"There are numerous examples of this sort and it does not require accurate cost data to prove that market prices do not reflect manufacturing costs, and that the manager who knows his margin of profit on each style has an important advantage in any market.

"Just to illustrate the point, let us compare the market prices on two standard print constructions during the past four years. In 1918 the government fixed the price on 38½-inch 64 x 60 5.35 prints at 83 cents per pound, and on 39-inch 80 x 80 4.00 yard at 86 cents per pound. This margin of three cents per pound was about the same as had existed just previous to price fixing and was accepted by everyone as fully covering the difference in cost, because the styles are made from the same yarns.

"Soon after price restrictions were removed the margin rose to over six cents. By June 1919, it had risen to 16 cents per pound, and it averaged this amount during the last six months of 1919. This large difference attracted more mills to the 80 x 80 style and early in 1920, although the prices continued to rise, the margin began to narrow. Soon it was below five cents and at times since then 80 x 80 has sold for less per pound than 64 x 60. Although such margin fluctuations may at first glance seem excessive they are not at all unusual. Even greater fluctuations occurred during this same period among fancies, specialties and fine goods.

EFFECT OF WASTE ON PROFITS.

"During the year just ended the Fall River mills have paid in dividends an average of 95½ cents per spindle per year. This is much more than they earned and more than the average paid during the past 30 years. Expressed in cents per pound this is the equivalent of about 2 4/10 cents per pound of cloth. Tonight we have seen how losses occur which if added together would amount to several times this sum.

"Probably some of you have already begun to think of the case of an Irishman who decided during the recent high price of coal that he needed a new and better stove. He was shown a fine lot of parlor stoves and among them one of those very efficient stoves where you place the coal in at the top and it feeds down upon the fire. The dealer claimed that this one could be banked for several days and assured Pat that with it he could save 50 per cent of his coal bill. Pat was quick to see the advantage and promptly decided to take two of them and save 100 per cent.

"It is hardly necessary to point out that the various wastes previously mentioned could not all occur in one textile mill. In fact if two or three of them occurred to the full extent at one time, they would be sufficient to put the mill out of the running. Nearly every mill, however, has some of these losses to a troublesome degree. A mill may get very good production but be careless about the weight of their goods. Another mill may be operating very efficiently with low waste and a high production and yet be making cloth which shows less than the average margin of profit. A treasurer may be handicapped by an old mill with machinery that cannot be speeded up. Yet by keeping his waste and expenditures low and the weight of his goods to standard and by specializing on the more profitable constructions of cloth, he may show very satisfactory results."

In concluding, Mr. Loper reminded the men that "We have here an array of wastes worthy of our best thought. Tonight we can merely discuss them but tomorrow in the mills we can each help to reduce them. Some of them may look so formidable that you will be inclined to say to yourself, 'They are too big for me. They are things for the "super" to worry about.' But he cannot correct them alone." Mr. Loper then repeated an aphoism that he said F. W. Taylor considered the most important lesson taught by his years of study of manufacturing problems: "Several men when heartily cooperating, even if of everyday calibre, can accomplish what would be next to impossible for any one man of exceptional ability."

Practical Discussion.

Following the address by Mr. Loper, Mr. Nichols resumed the chair and called for discussions and questions that the audience might care to take up. "In order to draw anything out of a bank you have to first put something into it," he said. "The same applies to this meeting, and you must put something into this meeting by asking questions, and I trust you will take every opportunity to do so."

There was no reticence on the part of those present to ask questions, and following is a report of the discussion which developed after Mr. Loper's paper.

"Just what is meant by invisible waste and net waste?" asked one man.

"Now, both of those points were mentioned in the talk but they were not explained," answered Mr. Loper. "Invisible waste is practically all cotton, and it is largely because the cotton contains moisture, and if there is no invisible waste, the cotton opened would be equal in weight to the cloth you took from the cloth room and the waste that went to the waste house. But, however, the weight of the cloth from the cloth room and the weight of the waste sent to the waste house do not agree with the cotton opened. Most mills speak of the difference as 'invisible waste' and consider the biggest part of it as moisture, that evaporation coming through the drying out of the moisture as the cotton goes through some of the departments." In one South Carolina mill that was a client of Mr. Loper's they found an invisible waste of over four per cent and as near as it could be traced it was due to this fact of evaporation. This was proved by leaving the cloth in the cloth room for a period of time when the cotton would be dried out. Then the cloth was removed to a shed exposed to the outside humidity, and it was found that the cloth regained from 1½ to 2 per cent during a period of several days.

"The net waste," continued Mr. Loper, "isn't so well understood, and you will find people who differ on the subject. *Gross waste* is the difference between the cotton put in and the cloth taken out and runs around 18 per cent in this section in print cloth mills. Now the waste taken to the waste house may be sold and if this money is re-invested in cotton it will buy the equivalent cotton to reduce this 18 per cent waste to two or three per cent less. The smaller percentage obtained after this imaginary replacement is called the net waste and runs around 14 to 16 per cent in this section."

The next question was specific and referred to the time of operation: "Take a department that runs five hours, supplying a department that runs 5½ hours, is it better to run the former department the full 5½ hours or run it the minimum five hours?"

Mr. Loper replied that that question would have to be studied pretty carefully in the particular mill in mind. "I think that the weaving room should be pushed all it can be pushed, thereby pushing the spinning room, and even if a surplus is made in the spinning room then the yarn may be sold," he continued. "Ample machinery should be provided for the carding, for this is the process that is the foundation for good weaving and spinning, and gives you more time to devote to the spinning and weaving where production counts most for the mill's profit."

"Mr. Loper, you referred to the proper incentives to get the most production out for the workingman; will you please explain further?" was the next question. "There are a great many things besides wages that will interest a workingman," was the reply. "If an employee sees a chance for promotion ahead of him, this arouses enthusiasm. You can get a great deal more from employees if they realize that their success in producing results will be rewarded by promotion and you can spoil the enthusiasm of a workman by bringing somebody from the outside to fill a higher position. Instead, give your present employee a chance of becoming a superintendent or overseer of a department. Another incentive is to change a workman from day pay to piece work and not change this piece work rate even if he does make more than he formerly did, for the mill is still benefitting by the result. The spirit of game will put enthusiasm in men by having them compete in various ways. An illustration may be given of where a lone boy sawing wood finds it irksome, but upon putting a number of boys on two teams and having them compete in sawing contests the aspect is soon changed from work to play and enthusiasm, and this same idea can be applied to places in the mill."

"How would you go about changing from day rate to piece work rate," someone asked. "In the little talk regarding the winding of the wool yarn we had a fair example of the way I would suggest piece work. Now one of the unfortunate things about piece work rates is that they have a rather bad history. Without giving the thing much thought and care mills have raised a workman from $20.00 day pay to $30.00, when they were not worth more than $22.00. Later reducing this pay from $30.00 to $22.00 is just why piece work has such a bad standing, but if piece work rates are set right, you get production through a cotton mill. Just as the overseer did when setting the rates on the winding of wool yarn; they must see if their working conditions are right. If the workman has poor light and if he is working in inconvenient places, try and straighten out these things before you begin to set the rate. Make conditions right, then you can begin to set a rate and then study it, and it will make a useful tool for you. If there is the proper enthusiasm in a plant and the employees have confidence in their superiors, it will very often get results quickly."

"Is the quality of the work as good on piece work as on day pay," Mr. Loper was asked. "You can get good quality on piece work rate if you have your roving marked so you can place the speeder tender's responsibility, and careful inspection of the cloth in the cloth room, and at all other points possible. Besides, the fact that the piece worker receives a bigger envelope attracts the better class of help and consequently the quality is better."

The next question was whether the waste made on the automatic loom is more than that made on the plain loom. Mr. Loper, in replying stated that "we went into that question somewhat when studying the automatic loom with the production association here, and we found cases where the waste was considerably higher on the automatic loom than on the plain loom, on constructions where you had to run a feeler motion on the filling change. Running on ordinary print cloths, however, the automatics did not make any more waste than plain looms on the same cloth."

Mr. Loper then became the interrogator by asking "I would like to ask the opinion of the men here whether they think it is worth while to have the overseers do their own clerical work or have clerks?"

After a vote on the subject, Mr. Loper continued, "Clerks it seems to be. Yes, clerks are pretty handy to have. Anyone familiar with the conditions knows that you will find overseers doing messenger service, running out to the office with cloth, samples, etc.; and can also find overseers in their offices working out payrolls. You can hire clerks who do that work for $12 and $15 a week. If you have a small mill and there isn't work enough for the overseer without working up the payroll, then let him

work up the payroll. Then he knows just what everyone is drawing and before the operator gets his pay the overseer knows if it is correct and often avoids confusion. But if the mill is a fair-sized one, and the department is run up to reasonably good standards, there is a man's size job for the overseer in the department itself. The clerk will save more than his cost, by the overseer being in his department instead of in the office."

One man in the audience stated that he had rather lose a good second hand than a good clerk.

Mr. Loper then raised the question, "When I pointed out the difference in profit on different styles of cloth, someone is apt to come back with the question of cost of changing over a loom.

"When you wish to make fancy cloth, you can't tell how long it will take to rig up the loom with the style. But in ordinary weaves, for example, satins, and pajama cloths, the change is not a very serious proposition, unless it is rather extensive, and you can change the loom over to pajama cloth for about 50 cents. If you offer to pay your fixer 50 cents he will be willing to make one of those changes. Fifty cents on 200 pounds of cloth (about one beam full) makes ¼ cent per pound. So if the loom is going to run off one warp you would only have an extra cost of ¼ cent a pound. If there is a difference of two cents a pound on the profit of the cloth the mill can well afford to change the room over."

"Is stick waste worth 25 or 29 cents a pound when cotton is selling for 25 cents?" asked a man in the audience. "This is not a very essential point for the reason that it is such a small factor in the matter that it doesn't affect the cost of the cloth to any degree," replied Mr. Loper.

"What effect does labor turn-over have on waste through the mill?" was next asked. "Your question that labor turn-over causes waste in any way is certainly opportune," said Mr. Loper. "I know of a cotton mill that had a very efficient overseer of the weave room and the mill thought they were paying him all they could afford to. They let another mill hire that boss weaver away from them, and production promptly slumped about five to seven per cent. This was equivalent to a loss to the mill of one cent a pound on the cloth, or equal to at least two or three years of the overseer's salary. My experience is that you have to pay to get a good overseer and keep him after you get him. It took this mill six months to get this shed back to its former production."

The next inquirer asked if running yarns on the heavy side pays by the extra production. Mr. Loper reported that he had once worked this out for a mill treasurer who wanted to know if a gain or loss was made by running his numbers on the heavy side, and investigation showed that his loss was three-fourths as much as if a lighter standard of yarns had been used. "There is the question of how, at times, a mill may have a bad run of cotton where there is nothing else to do but run the work heavy. Certainly this is excusable," said Mr. Loper.

The question of humidity and its effect in this connection was brought up by a man who asked, "Cotton has eight per cent moisture under ordinary standard conditions, and if it is raised to 11 per cent in the weave room, is this an excuse for overweight of cloth?"

"If the cloth has an 11 per cent regain in the weave shed it will soon lose it readily in the ordinary cloth room under ordinary conditions," said Mr. Loper. "At the South Carolina mill I referred to before, after the excess moisture was put into the cloth and the cloth taken to the cloth room, in 24 hours the cloth lost from one to two per cent moisture. This is a favorite excuse for overseers to hide behind when numbers are heavy. Sometimes it is true. When the atmosphere is so damp that you can't keep a good humidity in your mill, your weights may go higher. Mills should have, or rather it is a good idea to have, laboratories of their own. Oftentimes overseers will give dampness as an excuse for heavy weights when a laboratory would dispute this."

"Do the present grades of cotton give more waste than back say in 1880?" was the concluding question of the discussion. "The kind of cotton in the South in 1880 was different from that which we get from the South today," Mr. Loper pointed out. "Today you may buy cotton out of a section that may have several different varieties of cotton. So many different seeds have been planted in the same locality to combat the boll weevil that a mixture of fibers and staples result. Consequently a larger percentage of waste is taken out than before. Nevertheless, even in 1880 when we were working a 60-hour week and having the best of cottons, our profits were no greater than we are making now with the 48-hour week and poorer grades of cotton. It is brains and cooperation that has done it."

This concluded the discussion, and Mr. Nichols thanked the audience for their continued interest in the meetings, and hoped that they would still show the same enthusiasm and be present at the next meeting on January 9th, 1923, the subject for that meeting being, "What are we trying to do by means of our labor laws?"

E. LEE SKIPPER, superintendent of the Kershaw Cotton Mills, Kershaw, S. C., was recently elected a member of the board of directors of that company.

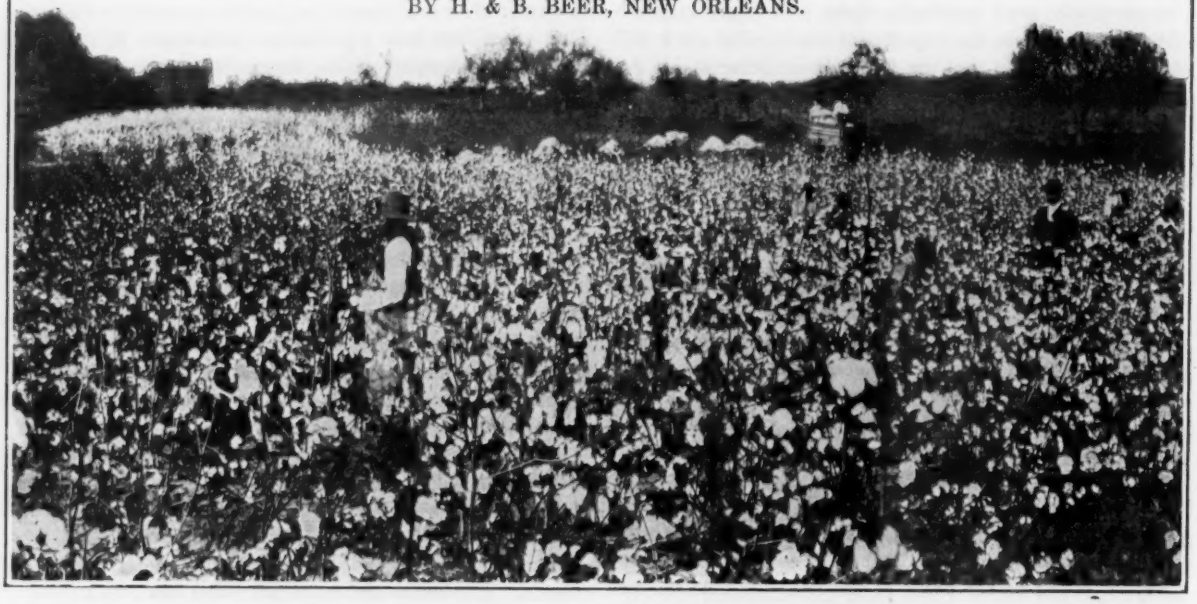
J. M. KELLEY has become carder at the Lauderdale Cotton Mills, Meridian, Miss. Walter Grayson now has charge of the spinning, Frank Page is the overseer of weaving, and Wiley Reynolds is overseer of the cloth room, J. M. Gunter has charge of the dressing room as overseer, and S. P. Appleyard, formerly of Tuscaloosa, Ala., is overseer of dyeing. Guy McClellon, from Tupelo, Miss., has accepted the position as master mechanic. J. W. Fernander is superintendent.

The Westinghouse Electric & Manufacturing Company has leased a six story building to be erected on a lot 100 by 150 feet at Jones Ave. and Marietta Street, Atlanta, Ga., at a cost of $360,000. The building, which is to be known as the Westinghouse Electric Building, will be constructed according to the company's specifications and will be used as an office, warehouse, and service station. Construction work was started December 1 and will probably be completed by next May.

Due to the destruction of their former offices and laboratory in the Trust Building by fire on December 16th, H. A. Metz & Co., Inc., manufacturers of aniline and alizarine colors, dyestuffs and chemicals, announce that the new location of their southern offices is 101½ West Trade Street, suite 7 and 8, Charlotte, N. C.

A Review of the Year in Cotton

BY H. & B. BEER, NEW ORLEANS.



New Orleans, December 15th, 1922.

As the calendar year draws to a close, and as the dawn of the new year approaches, there is a ray of hope that bids fair to spread the doctrine of brotherly love in keeping with the spirit of the season, perhaps result in lasting peace throughout the universe.

No better barometer of the constantly improving world conditions, particularly abroad, could be had than the recent important political events which are of no small significance.

During the past week the Japanese restored Shantung to China, which was held, except temporarily during the war and until lately by Japan, by Germany during the past 24 years.

A satisfactory adjustment of the situation in Asia-Minor is in process of solution, to such an extent that press advices are to the effect that Turkey is willing and ready to become a member of the League of Nations.

Although postponed until January 2nd, negotiations for an amicable settlement of the Germans reparations problem seem to be favorable for the reaching of an understanding, especially between England and France, as both principals appear disposed to make important concessions.

Meanwhile the centuries old dispute between the British and Irish has been brought to a head, resulting in the establishing of the Irish Free State whereby Ireland takes her rightful place among the nations of the world.

In other words, the world, especially Europe, is striving to get its house in order, first by restoring peace and harmony with the people of the earth, after which peace and contentment will follow, the offspring of which will be the expansion of industry and commerce, and, consequently, an increase in international trade.

Reflecting the recent important international and economic developments, the pound sterling has steadily advanced from its low level of $3.18 in February, 1920, to within 20 cents of its par value, it now ruling around the $4.65 level, indicating that confidence is being restored abroad, which means much for trade expansion, particularly for British business interests, and indirectly of much benefit to other countries, especially to the United States because of the value of the rise in foreign exchange in its relation to exports, particularly as regards cotton.

Although the cotton market has experienced an important advance since the issuance of our "Special Cotton Market Review" in October, late developments have been such as to make the present and prospective status of the cotton situation, from a supply and demand point of view, one of unusual strength, perhaps stronger than for any season during the past half century.

Our bullish deductions of the recent past were based on the October 3rd. government crop forecast for a yield of 10,135,000 bales, and probably world requirements in excess of 12,000,000 bales. Subsequently, or on Dec. 12th, Washington released its final crop estimate of the year, placing the indicated production at only 9,964,000 bales of 500 pounds gross weight, but as the average gross weight of running bales is 503.5 pounds, the year's indicated yield in running bales is only 9,894,000 bales.

Consequently our ideas as to the future course of the market are fortified to the extent that the indicated crop has been revised downward, while estimates as to the season's consumption are being raised because of the continuance of heavy consumption by American mills and owing to the continuance of free exports to Europe, now running only slightly less than last year when the exports for the whole season were 6,122,000 bales. Therefore, we continue to entertain a favorable opinion of the market and anticipate much higher prices later in the season.

Making use of the government's final crop figures, the

large takings by American mills and the liberal exports so far this season, we arrive at the following indicated results, which are sensationally bullish, which assertion will probably be generally admitted when the present subsurface features begin to unfold themselves:

UNITED STATES	THIS SEASON	LAST SEASON
United States ports and interior stocks Aug. 1	1,726,000	6,025,000
Crop, lint, government estimate	9,964,000	7,978,000
Linters, estimated	450,000	398,000
Total season's supply	12,140,000	14,401,000
Less Am. and Canadian mill requirements	6,700,000	6,553,000
Leaves for export	5,440,000	7,848,000
Less exports, if	5,440,000	6,122,000
Leaving U. S. ports and interior stocks July 31	none	1,726,000

Such an allowance as the above for exports is impossible, else there would not be a bale left on this side of the Atlantic by the end of July, 1923, outside of the mills. Nevertheless, since exports so far this season, or to Dec. 14th, are running only 114,000 bales less than one year ago, or 2,492,000 vs. 2,606,000, they are running on a basis of 6,008,000 bales at present.

The South cannot spare five million, much less six million bales for export this season, otherwise there would be no cotton left on this side of the ocean for protection of the contract markets, etc., next summer.

How, when, and where Europe is to obtain its partial, much less its full quota for the remainder of the season and until another crop comes on the market next September or October, is beyond our comprehension. That the supply situation is serious from the spinners' point of view, no one will deny.

These conditions are due mainly to the destruction wrought by the Mexican boll weevil in the United States, the drouths in the southwest and the pink boll worm in Egypt, resulting in the world consuming 8,603,000 bales of all kinds in excess of what was produced during the past two years, and threatening to wipe out reserves before the close of the present season, which contentions are supported by the following official figures furnished by the government, linters not included:

YEAR	WORLD'S	PRODUCTION	CONSUMPTION
1921	American Cotton	7,954,000	12,293,000
1921	Foreign Cotton	6,787,000	7,754,000
1921	All Kinds Cotton	14,741,000	20,047,000
1922	American Cotton	9,964,000	12,293,000
1922	Foreign Cotton	6,786,000	7,754,000
1922	All Kinds Cotton	16,750,000	20,047,000
1921 and 1922	Total all kinds	31,491,000	40,094,000

The last state to be invaded by the weevil was North Carolina. The weevil made remarkable headway in that state this year, but too late to do much damage, and North Carolina made a good crop, but it is feared that this year's production will be the last good crop that will be made there, as heavy damage is anticipated next year. In 1920 South Carolina made a crop of 1,652,000 bales, whereas this year a yield of only 530,000 bales is expected, which gives an idea of the damage done by the weevil, and almost every state, from the Mexican border to the Atlantic coast has met with the same fate to a more or less extent during the past 30 years, the damage becoming more noticeable as the pest spread over the belt, particularly of late years, as is noticed by the reduced yield per acre and the small crops, the liberal use of poison nothwithstanding.

We have read that the weevil begins to hibernate (seek winter quarters) about the 15th. of November. If that be true, the outlook for the next crop is not at all encouraging, as the weather has been mild so far this season, especially so up to the middle of November, which makes it possible for a large percentage of the weevil to survive the winter, in which case infestation may be general and heavy again next year.

However, before we hear as to how the weevil fared this winter, the expected bullish statistical developments are likely to begin to unfold themselves. They have started to do so already. What else could be looked for when surface and subsurface features of the situation are about as follows:

AMERICAN COTTON	THIS SEASON	LAST SEASON
Carried over in the interior Aug. 1st.	1,276,000	4,690,000
Crop, including linters, estm.	10,414,000	8,376,000
Season's supply	11,690,000	13,066,000
Marketed to Dec. 8th	6,884,000	6,018,000
Remaining to be marketed Dec. 8th.	4,806,000	7,048,000
World's visible of American, Dec. 8th	3,635,000	4,302,000
World's available, ex. mill stocks, Dec. 8th.	8,441,000	11,350,000

Inasmuch as the world's available of American cotton, exclusive of mill stocks, is 2,909,000 less than one year ago when there was such a scarcity of cotton later in the season, and since 2,242,000 of the shortage compared with last year, is in the interior, we believe that we are justified, even at prevailing comparatively high prices, in anticipating much higher prices eventually.

In order to acquaint the industrial gear user with the advantages of Micarta gears, the Westinghouse Electric and Manufacturing Company has issued a 20 page booklet, Folder 4506, entitled "Salient Facts on Silent Gears." The booklet describes the advantages of the use of Micarta gears and pinions and gives photographs and data describing some of their applications, tables of gear data, etc., enabling the gear user to judge whether or not they are applicable to his machinery.

Some Notes on Size Regain

BY JAMES ROBERTSON.

In reading the columns of COTTON I have not seen very much discussion in regard to the percentage of size regain which occurs at the slashing process. Surely this is a very important item in the matter of keeping the cloth weights for if the size regain amounts to as much as 10 per cent of the weight of the warp yarn this will be equal to about 5 per cent of the finished cloth. Now suppose we vary the percentage of size 2 per cent of the warp yarn; then we have affected the weights of our cloth 1 per cent, which amounts to 4 points on 4.00 yard goods. Finding our cloth weights going heavy by 4 points we would naturally seek to remedy the matter in the card room by lightening up, whereas the matter may be entirely due to the varying percentage of size regain.

In speaking of size regain, I mean to say the percentage of increase in the weight of the yarn after slashing as compared with the weight of the yarn on the warper section beams. It may be questioned whether we should figure this from the finished yarn after slashing, saying "What percentage of this finished yarn is size?" and where we would use the sized yarn weight as the divisor; or whether we should use the unsized yarn weight as the divisor, saying "What percentage of weight did the original yarn gain?" I should be inclined to use the latter method, where we compare the regain with the original weight of the yarn.

There are a number of things that enter into this matter of regain and I shall endeavor to outline a few of them. First among the factors which affect, in a greater or less degree, this percentage of regain is to be found:

The length of boiling time. The writer has found, through actual test, that a variation of as much as two and three per cent was found in the regain when the boiling time was changed from one hour to 1¼ hours, and again, a similar variation when the boiling time was changed from 1¼ to 1½ hours. The yarn showed less regain with the longer boiling due to the thinning of the starch and the greater penetration secured. However, the yarn presented a much softer feel after giving the starch the longer boil.

By the length of boiling time, we designated the following procedure: The water as called for is placed cold in the tank and the necessary starch added. After bringing to a boil the compound used was added. At the adding of the compound the boiling time commenced.

Method of making the mixture. In making the size mixture it is very erroneous to mix so much starch, so much compound, and so much water, calling this a mix and bringing it to a boil, and boiling for the fixed standard of time. Instead, the better method is to mix the starch with a quantity of water less than the required amount, adding the compound also to the required amount. The reason for adding this deficiency of water is to allow for the swelling of the starch and also for the condensation water from the steam used in boiling. To continue, after adding the required starch and compound to the smaller amount of water the solution is boiled for the desired length of time and then sufficient water is added to give the required number of finished gallons of mixture. In this manner any discrepancy in the swelling of the starch or condensation of the steam, is automatically taken care of.

Weight of the squeeze rolls. Some mill men designate the weight of the squeeze rolls as such-and-such, believing that by the weight alone a certain amount of size is squeezed out. If we stop to reason we will see one of the more important facts to be considered is the cushioning of these squeeze rolls. A 450-pound squeeze roll with fewer yards of wool cloth will squeeze out more size than a 450-pound squeeze roll with double the amount of cloth used. Also, if the rolls are not taken care of—as not wetting down at night—the covering soon become hard and stiff to the extent that the wool slasher blanket loses its resiliency. A good method the writer has used is to cover the back squeeze roll with the ordinary slasher blanket together with a cotton cloth sheeting blanket of several revolutions. This forms a hard surface that squeezes out the excess size, at the same time squeezing and bruising the fibers so that the sizing penetrates the yarn more thoroughly. The finishing squeeze roll is given as soft a cushion as possible so that the outer section of the yarn may retain its size and also the wool blanket following the contour of the yarn sizes the interstices of the yarn—which, to be more explicit, means sizing the yarn down between each strand uniformly thus preventing a sawtooth edge on the yarn.

The point discussed in the foregoing paragraph very materially affects the percentage of regain, for if more or less size is squeezed out, then more or less size regain percentage is obtained.

Fluidity of Starch. The fluidity of the starch will affect the amount of the regain, for the higher the fluidity the greater the regain and the penetration, and the lower the fluidity the less regain may be expected. A 40 fluidity starch will give a greater regain than a 20 fluidity starch.

Steam Pressure on Cylinders. The degree of drying will affect the degree of regain obtained by leaving more or less moisture in the yarn after being sized. Yarn almost baked and covered up by the other layers of yarn cannot be expected to regain in a few minutes the normal regain of the weave shed. Also this baking may vary the natural characteristics of the starch so that it will not hold its normal amount of moisture.

Depth of the Immersion Roll. The depth of the immersion roll will permit a greater or smaller penetration of the size into the yarn and affect to some extent the amount of regain secured.

Level of Size in the Size Box. Size running low in the box will certainly affect the amount of size taken up, and the best answer to this is the use of the constant level system which will at all times give a uniform depth for the immersion roll.

Temperature of Size in the Size Box. Certainly the use of cold size will allow it to cling more to the yarn in lumps or strings to be squeezed off by the squeeze rolls, and a good penetration is not obtained; thus a smaller regain also is secured.

The foregoing are points well worth considering in deter-

mining the size regain; each is a factor that makes for or against the amount of size being put into the finished product.

Now arises the question as to what the limit should be in the percentage of regain used in sizing. The writer used the following method to determine if he was exceeding the percentage of sizing allowable: A spool of the standard yarn used was placed behind the slasher and allowed to run through the size box, over the cylinder and where it came out in front it was wound up on a reel and tested for strength. A skein of the original yarn was tested from the spool unsized. The increase in weight due to sizing was figured in per cent, and then the increase in breaking strength was figured in per cent. So long as the percentage of increase in breaking strength exceeded the percentage of increase in the weight of the yarn, then we knew that we had not sized too heavily. For example, 9 per cent increase in weight gave 11 per cent gain in strength, while a 10 per cent gain in weight gave a 13 per cent gain in strength. We were right in using the 10 per cent regain for sizing insofar as we were bleaching and finishing our own product. Surely we got better weaving, which was about 95 per cent on approximately 3,000 Draper looms against 90 to 92 per cent with the 9 per cent regain.

Accompanying this article will be found a table giving an example of a test which shows the method for securing the percentage of regain. This table is entitled "Size Regain Test."

Lastly, the matter of size regain very materially affects the total amount of waste made in the mill. That is to say that the higher the regain presented in sizing the less will be the total waste made when we stop to figure the cotton opened and the cloth made as a basis for the calculation. And we know that starch and compound are cheaper than warp yarn. Are they not?

Size Regain Test

BLANK MILL

Nov. 28, 1922.

Warp Beams

No.	Weight Net
1	458
2	393
3	392
4	399
5	403
6	399
7	395
8	389
	3228

Soft Waste 12 lbs. (Subtracted)

Net Fed 3216

Net Delivered 3585 pounds
Net Fed 3216

Regain 369 pounds

Percentage of Regain =

369 ÷ 3216 = 11.5 per cent.

Loom Beams

No.	Gross	Tare	Net
1	213	76	137
2	214	78	136
3	222	86	136
4	217	80	137
5	222	83.5	138.5
6	229	90	139
7	220	79.5	140.5
8	218.5	78	140.5
9	223	82.5	140.5
10	222	81.5	140.5
11	222	81.5	140.5
12	226.5	85.5	141
13	219.5	79.5	140
14	220	80	140
15	217	86.5	140.5
16	227.5	79.5	140
17	219.5	79.5	140
18	224	84.5	139.5
19	219	78	141
20	218	78.5	139.5
21	224	85	139
22	220	82	138
23	216	78	138
24	217	80	137
25	222	86	136
26	168	78	90
			3565.5

Hard Waste 19.5

Delivered 3585 lbs. net

What the Southern Mills Are Doing

The four weeks previous to this writing have seen a tremendous amount of development, expansion and improvement work announced definitely for the southern textile section, bringing to an encouraging conclusion a year, with its fluctuations of course, but one that contributed considerably toward a further settling of the foundation upon which the industry enters the new year. An especially large number of mill corporations filed applications for increases in capital stock, and quite a large percentage of these were to provide for further development and extension of mill properties.

In further keeping with the movement in this section to add further processes to the manufacture of yarns and eliminate the practice of shipping the primary mill product to other sections to be woven into fabrics, Stuart W. Cramer has announced plans for a million dollar development at the Mays Mill, Inc., Cramerton, N. C., where he will build a weaving mill for making fine fancy colored goods and for using the product of the 60,000-spindle yarn mill already in operation at that place. The addition will be built on the unit plan, with a view to the ultimate installation of about 2,000 looms. The new mill will be known as the Mayflower Mill, and the present company's style of name has been changed to Cramerton Mills, which, it is understood, will act as a holding company for the present Mays Mill and the prospective weaving plant. The capital of the organization has been increased to $3,000,000.

Another interesting announcement of this same nature is that the Cherokee Spinning Mills, Knoxville, Tenn., having increased their capital stock from $600,000 to $1,100,000, will add a large amount of floor space and install about 250 latest type automatic looms for the manufacture of high-grade ginghams and shirtings. The addition to the mill will be a two-tory structure, 184 feet wide by 310 feet long, and will house the new looms and complementary machinery, together with a complete bleachery and dyehouse. A storage warehouse will also be added.

Still another important report is that from Lumberton, N. C., which states that a new large weaving mill to manufacture fine colored cotton goods will be built at that place by H. P. Jennings, well known cotton manufacturer of that section. The initial capacity of the plant, it is stated, will be 600 looms, which have already been purchased. Mr. Jennings is president of the Jennings, Dresden and Lumberton Cotton Mills, all of Lumberton. The output of the new mill will be sold through the Hunter Manufacturing and Commission Company.

Announcement was made during the past month of plans of Groves Mills, Inc., at Gastonia, N. C., to erect Gaston County's 102nd mill, the plant to be known as Groves Mills, Inc., No. 2. They will construct a mill with 15,000 spindles capacity.

Gaston County's 103rd mill was also projected when the Ragan Spinning Company was organized to build a 10,000-spindle mill for the manufacture of fine combed yarns. The authorized capital stock will be $500,000. G. W. Ragan, R. L. and S. P. Stowe, A. G. Myers and Caldwell Ragan signed the application for the charter. It is planned to have the mill in operation by September 1923.

Work has begun on an additional story to the dyehouse of the Union Bleachery, Greenville, S. C., to cost approxi-

mately $12,000. The addition will be built by the Fiske-Carter Construction Company, and the floor space, 60 x 120 feet, will be used at present as a store room for chemicals and other supplies. The extension will be of the modern mill building type, main walls of brick, re-inforced with steel girders and fitted with steel window sash. At the present the output of the plant will not be affected by the addition, it is stated.

Judson Mills, Greenville, S. C., have recently placed an order for 60 additional three-and four-room houses for employees. The mill had previously ordered 130 homes which have been or are being erected. The additional housing was made necessary by an increased working force needed at the completion of the installation of new equipment now under way.

It is reported that the Eno Cotton Mills, at Hillsboro, N. C., will at an early date begin the erection of a large addition to their gingham mill.

Another report is that the Kincaid Mfg. Co., Griffin, Ga., is considering the installation of 12,000 additional spindles.

J. M. Odell Mfg. Co., Bynum, N. C., will install additional machinery to cost about $35,000, including four Fales & Jenks spinning frames, two Foster winders, five Saco-Lowell cards, and two speeders, two intermediates and one slubber of the Woonsocket type.

Construction of 72 houses for employees of the new Dixie Spinning Mills, Chattanooga, Tenn., is now under way. The houses will be from two to five rooms each, costing on an average $1,400 each. The first unit of this development, a 13,000-spindle plant, will be completed in August, according to present indications. This plant will be of standard mill construction, 385 x 150 feet, two stories in height. The entire development program, which will cover a period of years, will represent a cost in excess of $6,000,000, it is stated. In addition to the houses being constructed in the village, a community center will also be developed with an athletic field and park and other attractions.

American Yarn and Processing Company, Mount Holly, N. C., are planning additional spindleage to their present equipment, as well as the installation of new winding machinery and gassing machines, and the addition of new tape driven twisters at the Woodlawn mill. In addition to these improvements a modern plant for reclaiming chemicals at the mercerizing plant has been constructed.

Bids for the construction of the new cotton mill to be erected at Great Falls, S. C., by the Republic Cotton Mills will be opened on January 15. Plans now call for the erection of a building at a cost of $500,000 and the installation of machinery to cost $700,000, including 1,000 electrically driven looms. The building will be 400 x 400 feet, reinforced concrete construction, with saw-tooth roof. J. E. Sirrine & Company, Greenville, S. C., are the engineers.

Union-Buffalo Mills, Union, S. C., have let contract for the erection of 25 operatives' houses at the Union Mill and about 20 houses for the Buffalo (S. C.) plant, involving an expenditure of about $60,000.

Construction work has been begun on the new mill of the Nelson Cotton Mill Company, at Whitnel near Lenoir, N. C., which gives Caldwell County its 17th textile mill. The mill will have 6,000 spindles and will be organized to manufacture carded cotton yarns from 26s to 40s in single, two- and three-ply. J. L. Nelson is president and treasurer, and J. L. Nelson, Jr., is secretary and assistant treasurer.

Echota Cotton Mills No. 2, Rome, Ga., have inaugurated full-time operation with a night shift, and the Anchor Duck Mills of the same place are running full time.

Winder Manufacturing Co., Winder, Ga., will double the capacity of its plant, it is announced.

Permit has been issued to the John P. King Mfg. Co., Augusta, Ga., for the construction of a cloth room to cost approximately $3,000.

Winder, Ga., may have another cotton mill, according to a recent report which states that New England interests are considering the town as the location for a mill they propose to build in the southern section.

The interests of Marshall Field & Co., at Leaksville, N. C., are establishing at that place a branch of the Home-Crest Mills Corporation, to manufacture Wilton and Brussells rugs and carpets.

Initial contracts have been awarded for the construction of the $600,000 expansion program at the Calhoun Mills, Calhoun Falls, S. C. J. E. Sirrine & Company are the engineers.

The Riverside and Dan River Cotton Mills, Danville, Va., have received permit for the erection of a large cotton storage plant adjoining the No. 6 Mill of the Riverside group. The structure will be six stories high, 52 x 156 feet, and will cost about $80,000. It will be used as a storage house for cotton. Plans are also being drawn for an extension to their water storage and supply, together with additional filtering capacity for their new bleachery and finishing plant. Lockwood, Greene & Co., will have supervision of the work.

Construction work on the plant of the McLin Textile Corporation at Rome, Ga., is well under way. The completion of the plant is now a matter of a few weeks, it is stated, and the investment will represent a cost of about $35,000.

Montgomery Cotton Mfg. Co., Inc., Montgomery, Ala., will add 4,000 spindles to its equipment. J. W. Sanders is general manager of the mill.

Martel Mills, Inc., New York City, have purchased a number of plants in North and South Carolina, Alabama and Georgia, it is stated, including the French Broad Manufacturing Co., at Asheville, N. C.; Palmetto Cotton Mills, Columbia, S. C.; Lexington and Red Bank Mills, Lexington, S. C.; Middlesburg Mills, Batesburg, S. C.; Valley Falls Mills, Spartanburg, S. C.; Ashcraft Mills, Florence, Ala.; Martel Manufacturing Company, Egan, Georgia.

A new 350-hp. Babcock & Wilcox boiler is being installed at the Highland Park Manufacturing Co., Charlotte, N. C.

The Rowan Cotton Mills Co., China Grove, N. C., are planning to add 6,000 spindles to their plant.

An additional mill is reported to be under consideration by the Lincoln Cotton Mills of Alabama, Huntsville, Ala., to be located on the tract of adjoining land recently purchased by them.

Thrift Manufacturing Company, Paw Creek, N. C., is erecting 24 four-room houses for employees.

Smitherman Mills, Troy, N. C.; are considering plans for adding a considerable number of looms to their mill, and

"You're right, Tom", said the President. "When it comes to humidifying, reliability is the thing to tie to."

COMINS IMPROVED ATOMIZER

The most efficient device of its kind. Air and water openings separate. Both can be instantly cleaned by pull on lever operating cleaning wires.

How two little wires have saved Thousands of Productive Textile Hours

TO take care of crowded spaces where sectional or high duty humidifiers could not be installed, atomizers were early demanded. Our designing engineers met this demand in a typical American Moistening Company way. They not only produced the most efficient device for the purpose, but they made its efficiency continuously dependable. That means reliability.

Open as they are to the atmosphere, atomizers tend to become clogged up and inoperative. Easy cleaning of the tiny air and water openings was therefore essential to reliability. With American Moistening Company atomizers, a pull on a little lever sends two wires plunging through those openings. It's the work of a second. It can be done from the floor. No ladder is needed.

This little invention has saved thousands of productive hours for the textile industry.

Back of that simple accomplishment was a big policy—the policy that insists on Reliability above anything else. This policy has governed our business since 1888.

Whenever we offer a new or modified type of equipment, mill owners will know they can count on its being 100% reliable.

AMERICAN MOISTENING CO.

Sales Offices:
251 Causeway St., Boston, Mass.

Since 1888 reliable humidifying devices.

may increase the carding and spinning equipment of the plant.

The Edna Cotton Mills, Reidsville, N. C., will build a cotton storage warehouse, also a finishing and cloth room.

Contract has been awarded by the Stonecutter Mills Co., Spindale, N. C., for the 250 additional looms to be installed at their plant.

Norcott Mills Co., Concord, N. C., will build an addition to their plant to provide for 6,000 additional spindles.

Hannah Pickett Mills, Rockingham, N. C., are building a two-story addition at the rear of the weaving department which will make room for about 300 additional looms, making a total of 1,008. The lower floor of the new building will be used as an addition to the present cloth room.

Rhodhiss Mills Co., Rhodhiss, N. C., are building 10 six-room houses for employees.

Entwistle Manufacturing Co., Rockingham, N. C., will double the capacity of their mill, it is reported. They now operate 26,400 spindles and 600 looms on print cloths.

Flint River Cotton Mills, Albany, Ga., have taken over the routine expense of the community house and day nursery operated at their plant, according to a letter from F. F. Putney, president of the mill, to the chairman of the committee who have sponsored the activity since its inception.

The new school building being erected by the Shelby Cotton Mills, Shelby, N. C., will soon be ready for use.

Final plans and specifications have been accepted by the Mooresville (N. C.) Cotton Mills for the proposed additional building, and they have awarded contracts for the machinery. The building will be one-story, 76 x 180 feet, and 5,000 ring spindles and 2,500 twister spindles will be installed for the manufacture of 6s to 16s yarn.

Brown Manufacturing Co., Concord, N. C., has authorized plans and contracts for its proposed dyehouse addition and necessary machinery, at a cost of probably $50,000.

An office building is being constructed and other improvements being made at the Alexander Manufacturing Company, Forest City, N. C.

Nokomis Cotton Mills, Lexington, N. C., will add 28 new looms for weaving 36-inch goods, the machinery having been ordered from the Draper Corporation, Hopedale, Mass.

Phoenix Mills Co., Kings Mountain, N. C., have installed 100 new Draper looms and will soon replace 200 more of the existing looms.

Looms for the Art Cloth Mills, Inc., Gastonia, N. C., will be installed shortly.

The Lockhart plant of the Monarch Mills, at Lockhart, S. C., are arranging for the construction of 100 new homes for operatives, and the mill will be put on night shift.

The Lovera Cotton Mills, Trenton, Tenn., has been purchased for $150,000 by West Tennessee interests, and the name changed to the Trenton Textile Mills. Ira Phillips has been retained as manager.

Construction work on the Southern Bleachery, near Taylors, S. C., is under way. The organization was recently incorporated with a capitalization of $1,000,000, the incorporators being William H. Bannon, of Mansfield, Mass., John F. Bannon, of Central Falls, R. I., Joseph B. Warne, of South Orange, N. J., and Henry R. Stephenson, of West Point, Ga.

Hesslein & Co., Inc., New York City, have been made selling agents for the Autauga Cotton Mills, Prattville, Ala., manufacturers of chambrays, colored drills, and coverts; the O-Cedar Cotton Mills, Covington, Tenn., manufacturers of chambrays, chevoits and colored suitings; and the Lola Gingham Mills, Inc., Stanley, N. C., makers of fine dress ginghams.

The announcement of the change of interests which places the control of the Consolidated Textile Corporation in the hands of officials of the American Woolen Company, has a southern interest and therefore should find its way into this department. The southern mills affected by this change are the Pilot Division of Consolidated Textile Corporation, at Raleigh, N. C.; the Ossipee and Hopedale Divisions, at Burlington, N. C.; the Lynchburg Mill at Lynchburg, Va.; and the Ella Division at Shelby, N. C.; the Union Division, La Fayette, Ga.; the Henderson Division, at Henderson, Ky.; and the Bonham Division, Bonham, Texas.

The changes in the official board and directorate were as follows:

William M. Wood, Chairman of the Board and President of the American Woolen Co., was elected Director General and Chairman of the Board.

Andrew G. Pierce, Jr., Vice President of the American Woolen Co. and Treasurer of the Pierce Manufacturing Co. of New Bedford, was elected President and director of the Corporation.

George L. Shepley, Second Vice President of the American Woolen Co. and Henry P. Binney, director of that company, were added to the board of the Consolidated.

Messrs. Wood, Pierce and Shepley constitute the Executive Committee of three of the American Woolen Co. Four of the seven members of the board of the American Woolen Co., are now identified with Consolidated Textile.

William G. Rockefeller and Samuel F. Pryor were elected to the Consolidated board at the same time. Mr. Pryor is Chairman of the Board of the Remington Arms Company.

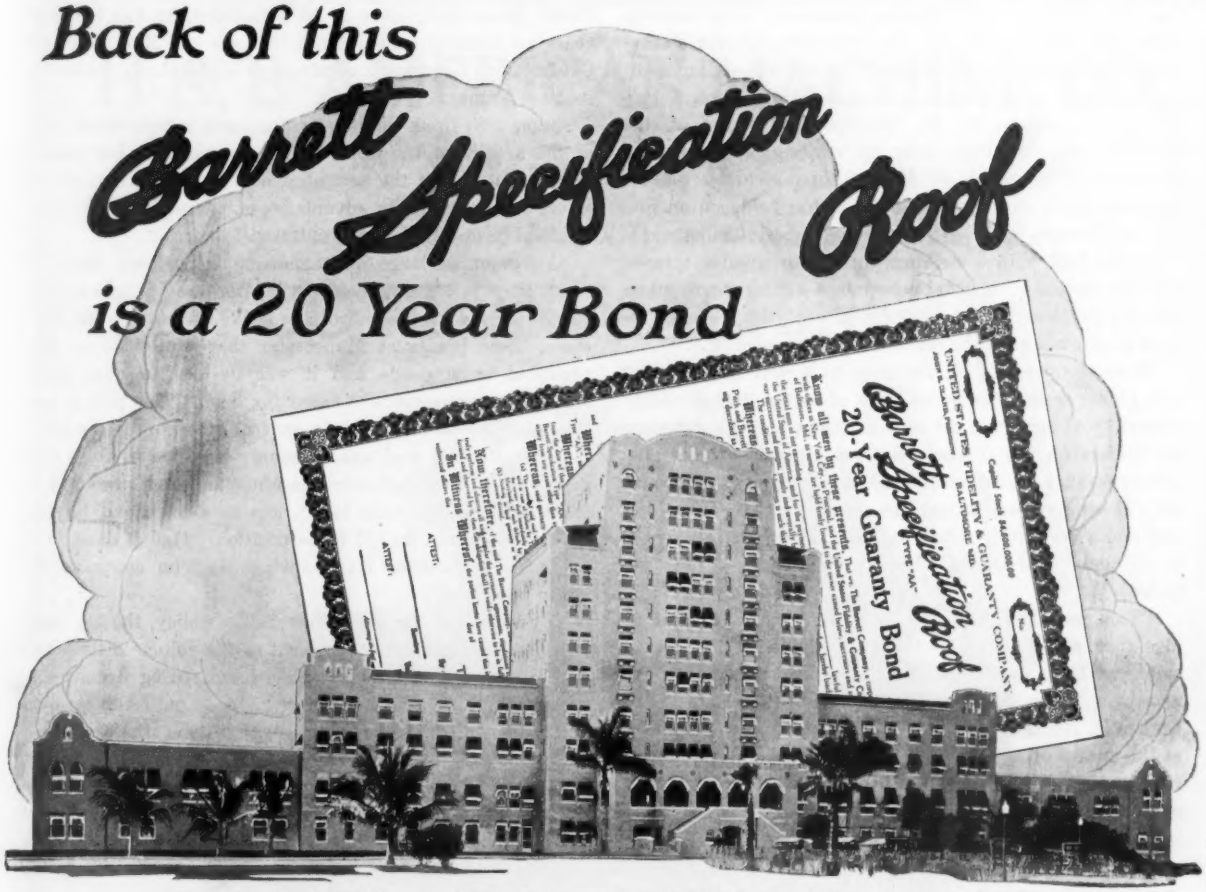
Other new members elected to the Consolidated board at the meeting held recently are: Henry L. Tiffany, cotton merchant; Wm. M. Butler, President of the Butler Mills, Hoosac Cotton Mills, New Bedford Cotton Mills, Quisset Mills and Nemasket Mills; and Charles T. Main, of Charles T. Main & Co., Industrial Engineers.

Frederick K. Rupprecht, who has been president of Consolidated, will continue in charge of the distribution of the corporation's products as president of Converse & Company.

Allen F. Johnson, formerly president of the Exposition Cotton Mills, Atlanta, Ga., a past-president of the American Cotton Manufacturers' Association, who has been with the Consolidated as vice-president in charge of operations, will continue as active operating superintendent, it is stated.

The first technical meeting of the Carolina Cooperative Council was held on the night of December 14, at the Central Y. M. C. A. building in Spray. This meeting was the first venture in technical discussion of the organization which is composed of the foremen and superintendents of the Carolina Cotton & Woolen Mills Company's plants, and turned out very successfully. It was planned on the order of the departmental discussion meetings of the

Back of this Barrett Specification Roof is a 20 Year Bond



Barrett Specification 20-Year Bonded Roof on Flamingo Hotel, Miami, Fla. Architect: Rubush & Hunter, Indianapolis, Ind. Gen'l Cont.: The Flamingo Co., Miami. Roofer: Cureton Lumber Co., Miami.

Regardless of Climate—the Bond Holds Good

There are no climatic restrictions on the Surety Bond back of the Barrett Specification Roof.

Take the roof on the Flamingo Hotel, in Miami, for instance.

Florida *winters*, of course, are easy on roofs. There's no snow. no frost, and practically no rain. But the *summers* are different. Miami's annual rainfall is exceptionally heavy—averaging over 63 inches. Most of it comes in the four warm months, June to September. And combined with this excessive rainfall are continuous high humidity and the intense heat of the tropical summer sun. Here is a roof-test even more rigorous than a Northern winter.

But all climates are alike to the Barrett Specification Roof. So the roof that protects the beautiful Flamingo Hotel, in Miami, from Florida summers, and the roof that protects the palatial new Mount Royal Hotel in Montreal from Canadian winters, are *both* bonded against repair and maintenance expense.

Two Types of Bonded Roofs

There are two types of Barrett Specification Bonded Roofs—Type "AA," bonded for 20 years; and Type "A," bonded for 10 years.

We will gladly send you on request complete information regarding these bonded roofs and copies of The Barrett Specifications. Kindly address our nearest office.

New York Chicago Philadelphia Cleveland Cincinnati Pittsburgh Birmingham Kansas City Minneapolis Atlanta Bangor Youngstown Toledo Columbus Richmond Baltimore Boston Detroit Dallas Omaha St. Louis New Orleans Salt Lake City Housto n Denver

The Barrett Company

THE BARRETT COMPANY, Limited Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S.

Southern Textile Association, and the subject for discussion was carding and spinning problems. The meeting began with the showing of "Thirsty Cotton," the Parks-Cramer Company film, showing the effect of humidification upon the different processes in the mlil. Following the picture, C. W. Phillips, a member of the Council, made a short talk on carding and spinning problems. The speech of Mr. Phillips included the recounting of his experiences in the cotton field, cotton gin, and on through until he had become superintendent. He closed his talk with a striking appeal for greater interest and cooperation among all the members of the organization. The points brought out in Mr. Phillips' talk formed the basis of discussion in the remainder of the meeting.

Representatives of all the mills took part in discussing such points as the number of bales of cotton that should be opened up at one time; the type of beater and the setting of the beaters on the pickers; the weighing of picker laps; variations that should be allowed on the cards and pickers, etc. These questions brought on other questions of like nature and a very lively debate ensued. From the differences in opinions expressed the good of such discussions was proved.

"This meeting was the first of a series of similar gatherings that will be held by the Council during the coming months. The Council has over 200 members representing nearly a dozen mills making various fabrics," reports Luther H. Hodges, in charge of the social and welfare work at this group of mills. "The organization is in a small way similar to the Southern Textile Association which has its general and sectional meetings. The next technical meeting of the Council will consider weaving and finishing problems and in the meanwhile, of course, the program committee expects to have its monthly inspirational and social meetings."

The New England Mill Situation.

Events of large importance in the New England cotton industry have come to public attention during the past month. The financial affairs of the Consolidated Textile Corporation, which includes the B. B. & R. Knight properties in Rhode Island, as well as many southern plants, have been greatly strengthened by the addition to the active management of the head of the American Woolen Co., William M. Wood, Andrew G. Pierce of New Bedford, and Messrs. Butler and Tiffany of New Bedford, who are associated in the management of some very successful fine goods plants there.

Allen F. Johnson will continue with the property as the active managing superintendent and Frederick K. Rupprecht will continue as head of Converse & Company, the selling agency.

In addition to adding needed strength to the financial affairs of the company, it is believed that the active association of these new factors will lead to many manufacturing changes and perhaps many consolidations of other smaller plants with the large aggregation. It is of especial significance that the men now coming to the fore are the ones in New England who have been conspicuously successful in handling large units of textile production efficiently, both in the practical as well as the financial end. Mr. Pierce is the vice president of the American Woolen Company, and beside being active manager of the Pierce Mfg. Co., and Pierce Bros., Ltd., mills at New Bedford, he has had for years an intimate acquaintance with the old New England Cotton Yarn Company's affairs, and other plants centering in New England.

Some men think the new arrangement merely takes care of the affairs of the Consolidated temporarily, but others are convinced that the new alignment is the nucleus of an effort to secure all the advantages of consolidation to New England properties in general.

An event of large merchandising importance was the re-entrance into the market of the Amoskeag gingham products. Following the end of the strike of ten months' duration, those plants at Manchester that were able to run produced some goods and it was decided to allot them among the customers who cared for them. This policy was followed instead of making a general offering, as the company usually did, and was commonly expected to do in this instance. In fact the trade as a whole had been prepared to see the Amoskeag make low prices as a means of buying its way back into its old trade position. Had it done so it might have unsettled many spring gingham contracts already placed.

By following the more conservative policy, the big company, which produces 40 per cent of the volume distributed in this country, not only stabilized the spring dress gingham market, but also insured a fair distribution to its own customers. Contrary to many expectations, these customers were ready to take on a great many more goods than it will be possible to produce up to April of next year. The offering served to convince selling agents of a market strength they had not fully measured, and it gave jobbers a great deal of added confidence in the worth of all the goods they have on order for spring at this time. It may be several months before the Amoskeag Company will be again producing in full, owing to the scarcity of operatives.

The labor outlook in the section has not been cleared by the settlement of the year's strikes. The textile unions have already voted to request advances in wages that will restore the war time levels which were lowered 22½ per cent in 1920. They are to present their claims to manufacturers. There is little or no prospect that they will be considered favorably and the next move in the matter will remain with the operatives and their unions. Nothing in the way of a strike is anticipated.

A more threatening trouble to come from unions and their leaders is the one of shorter hours. During the last political campaign in Massachusetts, Senator Henry Cabot Lodge agreed with cotton manufacturers to introduce into Congress a bill to make 48 hours a week compulsory all over the United States in the matter of employing women and children. This is not regarded as being anything more than a political move that will be tested out very soon after hands are shown in Congress.

In Rhode Island, the elections turned against manufacturers and the demand for a 48-hour law, to be renewed in that state, has a very fair chance of being acceded to by legislators. In fact, the position of the unions in making their demand in this state is strengthened by the fact that some large mills are already running on the 48-hour schedule, this being one of the concessions made to end strike troubles.

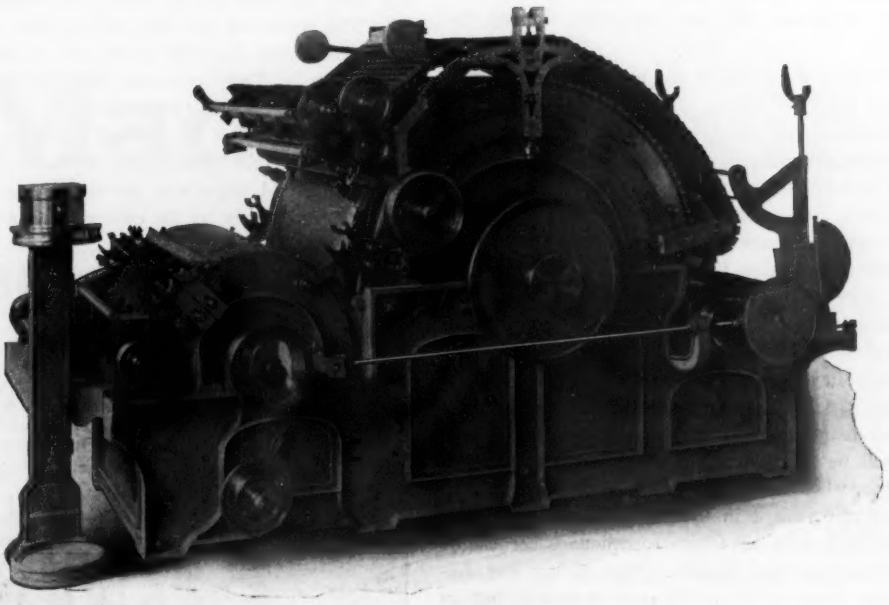
In New Hampshire, the elections resulted in partial

H & B AMERICAN MACHINE CO.

Pawtucket, R. I.

Southern Office: 815 Atlanta Trust Co. Building, Atlanta, Ga.

COTTON MACHINERY



Revolving Flat Card

OUR Cards are extensively used, and have won for themselves a high reputation for the quality and quantity of work they will do, the small percentage of waste made, and their durability and simplicity.

Amongst the many features and points of special merit embodied in the machines, which it would pay you to investigate are:

The Rigid Bend, mathematically correct at all stages of wear of the wire.

Perfect concentricity of Flats to Cylinder.

Arrangement for adjusting Flats whereby accuracy to the thousandth part of an inch is obtained.

Adjustable Cylinder Pedestals and Bearings.

Better quality of yarn made from the same cotton, or equally good yarn made from cheaper cotton.

Special bulletin sent on request.

success for the democrats in the lower house and they are expected to lead a fight for the enactment of a 48-hour law. The matter will be fought hard and it is believed that the Senate of the state will prevent the enactment of any further restrictive industrial legislation until federal action is taken, if ever. The struggle is certain to be bitter owing to the alignment of church forces on the side of the workers in some sections, notably in the cities of the state.

In Maine, where a 54-hour law has been accepted and fully established by referendum vote, an effort is now being inaugurated by the unions to overthrow the 54-hour law. It is not thought probable that it will be successful, but it is certain to add to the troubles and uncertainties affecting mills. From all of these things it can be inferred that New England labor conditions are not promising, to say the least.

Another event in the industry has been the marked tendency in many corporations to increase the capital stock by stock dividends. In the first ten days of December nearly a dozen textile mills gave notice of an expansion in capital. This development is in line with that seen in other financial channels. It is the desire of manufacturers to protect their reserves against tax raids by Congress. It is felt that unless this is done, the working capital now held in the form of working reserves will go the way of all things taxable in recent years and will bring about a restriction of industrial power in the cotton mills.

While this policy is protective to the stockholders it is inevitable that it will figure in the inflammatory talk that will be started among operatives by union leaders and agitators. It will be shown that stockholders have received great dividends, when they have merely been credited with wealth always represented in their investment. Hitherto, most New England mills have been conspicuous because of the low capitalization per spindle. This policy was followed in some instances to avoid state taxation, but in most cases it was followed because it was never felt that over a period of 25 years, cotton mills could pay more than an average of 6 per cent on about one half the replacement costs of machinery and real estate in average periods.

Still another event of very large importance was the announcement made by the Appleton Company of Lowell, Mass., of its purpose to build a mill somewhere in the South from its present reserves, and equip it with all the latest machinery for the production of plain napped fabrics and plain or staple ginghams. The mill now produces some of this sort of product in its Lowell plant but it has been trying year after year to get on to fancy work in the New England field, leaving the plain and simpler work to mills less hampered elsewhere.

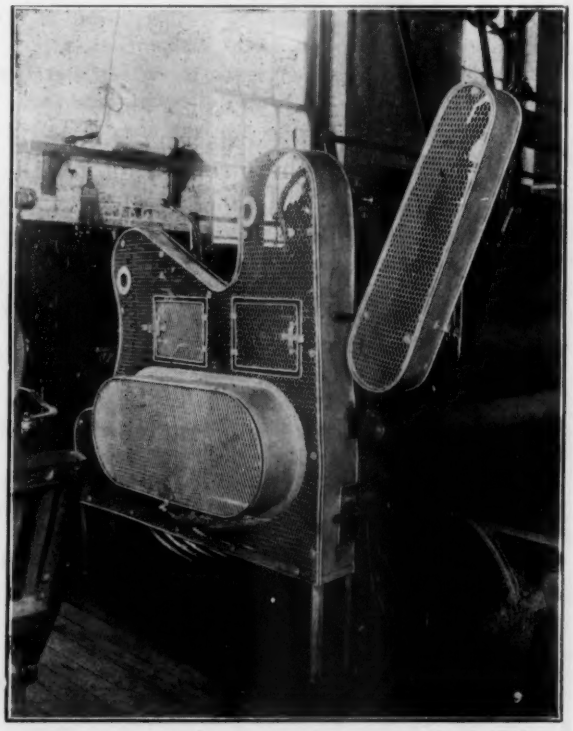
The Appleton is rich and well managed, and a duplication of its plant in the South will still leave it with reserves ample to take care of its merchandising needs. The point that it is sought to make now is that this old and rich company will not amplify its investment in New Englan but will go where investment is better protected and is welcomed. It is also reported again that it will not be many months before the Pacific mills enter upon an expansion of its already large investment in the South, probably at first by the addition of a very alrge bleachery. Other mills are known to be considering plans for a larger investment elsewhere, but they have only reached the stage of discussion in directorate boards.

The course of the market for cotton goods of late has been toward higher price levels in keeping with the rise in cotton and the rise in gray goods values. Bleached cottons have advanced to a basis of 17½ cents net for 4-4 Hill bleached goods, while ginghams are now quoted on a basis of 17½ cents for 32-inch staples in Amoskeag make, subject to the usual trade discounts. Percales and prints are higher for future delivery, and wide sheetings are now on a basis of 65 cents for 10-4 bleached Pequot standards.

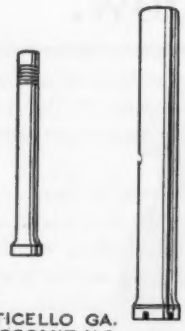
The mills are running more fully than at any time in two years, and in fact in many centers the output is the best that has been known since the European war broke out. The goods are generally sold ahead for delivery well into March, save possibly in the case of some of the gray goods mills in Fall River and New Bedford.

Among the manufacturers there is a great deal of questioning as to whether the demand will support 25 cent cotton throughout the spring and summer. Nearly everyone is guessing, and those who are not are inclined to, judge the outcome entirely by the course of events in Europe.

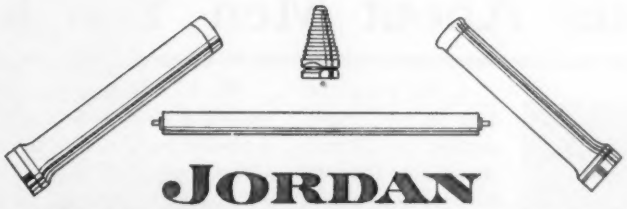
Hazard Advertising Corporation, 7 East 42nd St., New York City, has engaged James McCurrach to take charge of its plan and copy department. Mr. McCurrach was formerly with the Erickson Company, the Rowland Advertising Company, the Spencer-Lay Company and A. M. Stockman, and has spent six years in free lance writing and planning for clients in Washington and the New York territory. This growth of the Hazard organization will be followed by a move to larger quarters in the near future.



SUITABLE GUARDS ON NAPPING MACHINERY.
Courtesy National Safety Council.

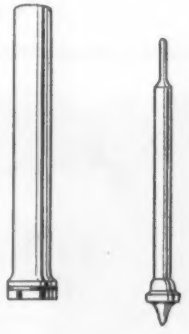


MILLS AT
MONTICELLO GA.
AND TOECANE, N.C.



JORDAN
MANUFACTURING COMPANY
BOBBINS

MONTICELLO, GEORGIA



Made in Dixie

Of a Recognized Quality and Service

QUALITY

But THIS Is Not "Bull"

Some advertisements which you read may contain a little "bull," but this one does not. And it's not "bull" when users of Bondaron Textile Leathers make statements like the following:

Last month the Boss Weaver of one of the South's largest mills advised us that the first "Bondaron" Check Straps placed on his looms in October, 1920, were still giving entire satisfaction. The Superintendent of another large Southern mill told us a few days ago that the first "Bondaron" Check Straps placed on his looms have given 35 months' service, day and night run, and so far there has not been a worn or broken strap.

These are only two of the many records of satisfaction and long life experienced by users of

Bondaron
"The Leather with the Hair On"

Check Straps

In actual use they last from two to four times longer than the ordinary straps—simply because they are made from higher quality, specially selected Foreign Hides, tanned by a valuable, well-guarded process which produces leather of amazing strength. The hair is always left on the leather for we never use weakening chemicals to take it off.

Bondaron Lug Straps, Harness Straps, Cone Belts, Round Belting and other Textile Leathers contain the same high quality materials and give long lasting satisfaction and economy.

Manufactured exclusively by

CHARLES Bond COMPANY

Leather Importers, Curriers and Belt Manufacturers
617-619 Arch St. Philadelphia, Pa.

LEATHER

Notes About Men You Know.

C. R. PHILIP, who is now representing the Damascus Steel Products Corporation of Rockford, Illinois, manufacturers of the "Dasco" line of steel tools, etc. He is traveling out from the company's southern representatives, The Walraven Company, Atlanta, Ga., working in the textile mill, hardware and other lines. Mr. Philip formerly represented the F. A. Ames Company, of Owensboro, Ky.

BENN KERSHAW, formerly textile director at the State Trade School, Putnam, Conn., has accepted the position of general overseer of weaving, designing and drawing-in at the Conanicut Mills, Fall River, Mass.

C. G. VOSS, formerly superintendent of the Buck Creek Cotton Mills, at Siluria, Ala., has been made superintendent of the Efird Manufacturing Co., Albemarle, N. C.

H. B. MILLER has resigned as superintendent of the Ashcraft Cotton Mills, Florence, Ala.

J. M. CROUCH has become overseer of weaving at the Smitherman Cotton Mills, Troy, N. C.

C. A. BUTTERWORTH is C. K. Taylor's successor as superintendent of the Mobile Cotton Mills, at McComb, Miss.

J. W. HUNT, formerly of Honea Path, S. C., has accepted a position with the Greenwood Cotton Mills, Greenwood, S. C.

W. E. FORD, formerly overseer of spinning at the Avondale Mills, Sycamore, Ala., is now at the Selma Manufacturing Co., Selma, Ala., as overseer of spinning.

B. A. WILLIAMS is now second hand of spinning at the Selma Manufacturing Co. He was formerly at the Avondale Mills plant in Sycamore, Ala., in the same capacity.

J. V. HUNT has accepted the position of overseer of weaving at the Brazos Valley Cotton Mills, West, Texas.

J. A. DALE was recently promoted to the position of overseer of spinning at the No. 1 Mill of the Rhodhiss (N. C.) Mills.

W. H. MOONEY, superintendent at the plant of the Bibb Mfg. Co., Columbus, Ga., has become superintendent of the Meritas Mills, Columbus, it is stated.

J. O. PORTER is now filling the position of superintendent at the Bibb plant, at Columbus, Ga.

H. J. STULTZ, secretary-treasurer of the United Chemical Products Corporation, Jersey City, N. J., was on a recent trip South, and was a visitor in company with his southern manager, Robert T. Grant, of Charlotte, N. C.

J. E. DOUGLAS has sold his interest in and retired as president of the Pioneer Cotton Mills, Guthrie, Oklahoma.

W. F. BALLARD, who recently resigned as overseer of carding at the Seminole Mills, Gastonia, N. C., has accepted a similar position with the new China Grove Cotton Mills, China Grove, N. C.

CHARLES A. PIERSON has become overseer of spinning and winding at the Sycamore Mill, Sylacauga, Ala.

C. E. GORE, formerly superintendent of the Romae Mills, Memphis, Tenn., has accepted a similar position with the Pioneer Cotton Mills, Guthrie, Oklahoma.

D. G. GARRISON has resigned as overseer carding at the Madora Mill of the American Yarn and Processing Company, and accepted a similar position with the Arrow Mills, at Lincolnton, N. C.

J. R. KILLIAN, formerly superintendent of the Union Division of the Consolidated Textile Corporation, at La Fayette, Ga., has become superintendent of the Ashcraft Cotton Mills, Florence, Ala., succeeding H. B. Miller, resigned.

W. R. ARMSTRONG, who has been overseer of spinning at the Prendergast (Tenn.) Cotton Mills, has become overseer of carding and spinning at the Ozark (Ala.) Cotton Mill Co.

C. A. DOWNE has been made general overseer of the cloth room at the Roanoke Mills Co., Roanoke Rapids, N. C. He was formerly assistant superintendent at the Holly Manufacturing Company, Charlotte, N. C.

D. C. EAKER, formerly at the Rankin Mills, Inc., Gastonia, N. C., has succeeded D. G. Garrison as overseer of carding at the Madora Mill of the American Yarn and Processing Company, Mount Holly, N. C.

E. L. GOBLE has become overseer of carding at the Manchester (Ga.) Manufacturing Company.

A. R. BARNETT, formerly at the Hamilton Carhartt Mills, Rock Hill, S. C., has been transferred to Mill No. 2 of the same company, at Carhartt, S. C., as overseer of spinning.

A. M. HIGHES has accepted the position of night overseer of weaving at the Peerless Cotton Mills, Thomaston, Ga.

JAMES WESSEN has become overseer of carding at the Kincaid Mfg. Co. No. 1, Griffin, Ga.

J. H. VAN HOLLEN, formerly overseer of carding at the Union-Buffalo Mills Co., Buffalo, S. C., has been made overseer of carding at the Baldwin Cotton Mills, Chester, S. C.

B. L. SCARBORO is now overseer of weaving at the Hannah Pickett Mills, Rockingham, N. C.

R. V. HOFFMAN has been made overseer of carding at the Seminole Mills, Gastonia, N. C. He was formerly with the Ruby Cotton Mills, Gastonia.

M. J. STEVENS has been made overseer of carding at the plant of the Standard-Coosa-Thatcher Co., Chattanooga, Tenn.

JOHN L. ASBELL has been made overseer of carding at the Seminole Mfg. Co., Clearwater, S. C., succeeding S. F. Douglas, who died on November 10. J. R. Thrift will be the new second hand.

A PART OF THE EQUIPMENT IN THE COUNTRY'S FOREMOST INDUSTRIES

TOLHURST EXTRACTORS

(Registered U. S. Patent Office)

In a recent list of the fifty largest users of advertising space in magazines, including manufacturers of perfumes, cameras, silverware, electrical equipment, and automobiles, 74% of the *POSSIBLE users of centrifugal hydro-extractors are NOW using TOLHURSTS.**

The great variety of industries represented in this list not only indicates the broad field for centrifugal extractors but suggests the decided preference for the dependable TOLHURST.

***If only actual users of centrifugal hydro-extractors were considered, the percentage using TOLHURST would be considerably increased.**

TOLHURST MACHINE WORKS, TROY, N. Y.

ESTABLISHED 1852 NEW YORK OFFICE, 111 BROADWAY

Western Representative:
John S. Gage,
8 So. Dearborn St.,
Chicago, Ill.

Southern Representative:
Fred H. White
Realty Bldg.
Charlotte, N. C.

San Francisco Representative
B. M. Pilhashy
Merchants Exchange Bldg.,
San Francisco, Cal.

Canadian Representative:
W. J. Westaway Co.
Main & McNab Streets, Hamilton, Ont.
400 McGill Bldg., Montreal, P. Q.

Eight Big Plants Stand Back of U S B & S Co. Products

Eight big factories with their combined immense resources stand squarely behind the quality of every U S B & S Co. product. The mill who purchases any product bearing this name KNOWS that it MUST live up to the reputation for quality and satisfaction which has characterized U S B & S Co. products since the first.

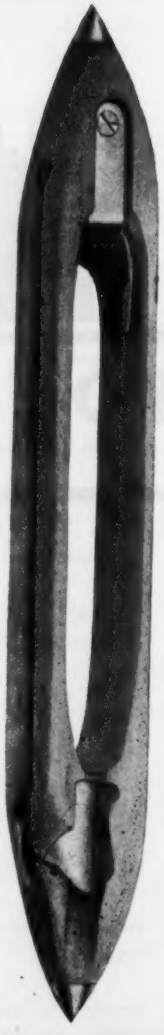
This immense organization, with its wide experience, more expert workmen and vast resources are able to turn out higher quality textile products at lower cost than any other manufacturer of like products. Today, U S B & S Co. products are considered the standard the world over.

U S Bobbins, designed by practical men with long experience, are stronger, lighter and absolutely smooth and true. A system of testing every bobbin on your own spindles eliminates any that do not run true.

The "Stetson" Hand Threading Shuttle is another famous U S product —the best exponent of the hand threading type of shuttle that has ever been put on a loom. U S Shuttles are made in every type for Draper, Stafford and Crompton & Knowles Looms.

Automatic loom users who have not already adopted our remarkable new "S EYE Automatic Shuttle" have only to try it, as a trial has convinced the most skeptical that it is the best automatic shuttle ever made for any kind of automatic loom. Several loom builders have approved the "S Eye" Shuttle, realizing that its simplicity, ease in positive threading, uniform tension and freedom from unthreading, misthreads, mispicks and broken picks are good reasons why a weaver of first quality can afford to use no other.

A sample of any U S product will be gladly sent on request. Ask today for catalog.



U S B & S Co. PRODUCTS

BEAMS	SPOOLS	SPEEDERS	ROLLS
Cotton	Moquette	WARP FILLING	Comber
Rubber	Drawing	CAP FILLING	Underclearer
BOBBINS	Warper	FLAX SPINNING	Drawing
SHUTTLES	Twister	TWISTERS	Winder
SKEWERS	Jack	TRIPTODS	ETC.
	Silk	QUILLS	
	Belting		

U S BOBBIN & SHUTTLE Co.

LARGEST BOBBIN and SHUTTLE MANUFACTURERS in the WORLD

Eight Factories

Providence R.I.

AN OLD TIMER SAYS

Did you ever get one of them? One of those endless chain letters, I mean. Well, I did and it put me to thinking.

Of course, being born and bred a cotton mill man I can't ever think about anything but cotton mill work. So I at once linked a link of that chain with my work. I reasoned it out this way: The superintendent, the overseers, the second hands, the section men and the operatives make up one unit in the cotton mill chain.

Perhaps your first thought is that this group should be considered as a chain in itself, instead of a unit. But it is not; it only represents one small chain, which must be linked up with other similar small chains to form the endless chain. Therefore, your thinker was thinking wrong. I claim that no *one* set of individuals comprised of a superintendent, overseers, second hands, section men and a set of operatives could operate a mill successfully.

"Gosh! Old Timer, what are you driving at?," you perhaps are thinking. Well, let me try to bring out my point with an illustration:

Suppose a cotton mill had been built on the Sahara desert twenty years ago. You, of course, know that the Sahara desert is a vast body of land where no vegetation grows and no people live. To build a cotton mill in such a place, and supposing that the people who run it get along by themselves, would of course make it impossible for any overseers or operatives from other mills to visit that mill. Letting our imagination run on, suppose the folks at this mill could not receive any mail, such as COTTON and other magazines.

All right, now let's leave our desert mill for a period of twenty years, and then go back and visit it today. If the reader is an old mill man, I ask him to let his mind wander back; if he is a young man, let him ask some old-timer to tell him something of the things that might be seen in a cotton mill built twenty years ago that has never changed its ways.

If we enter the weave room on Saturday morning, we would see a man going up and down the alleys giving each weaver a broom; then all the weavers begin to sweep out their alleys and around their looms. Meantime, the looms begin to stop, and by the time the sweeping has been finished and the girls have exchanged gossip and the men have all swapped knives and got a fresh chew of tobacco, the whole blamed weave room would just about be stopped.

At other times, we would see a weaver oiling his looms with probably two or three of them stopped, or making a brush to clean off with, or cleaning off his loom, and numerous other things that the younger generation of mill men would hardly believe possible, and that most of the old-timers have forgotten. Hundreds of other instances could be cited from every department of the mill to indicate what wonderful strides have been made in the mill during the last twenty years.

It only seems a few years back when the first weavers in the South were given six looms and then in a short while eight looms, and when the little 25-cent doffers swarmed around a spinning frame like bees.

Not considering automatic looms, weavers are now operating over 300 per cent more looms than they were then, and a large percentage of our present-day doffers are grown married men, with one man doing what it formerly took as many boys as could get around the frame to do.

What has brought about all this increased efficiency, this progress?

Two of the greatest factors have been the textile magazine and the textile school. COTTON is one of the big links in that chain. The textile associations have been another very important link.

Broad minded men soon realized that a man gained nothing by hiding his light under a bushel. We soon got out of that selfish rut and were glad to pass our good ideas to our brothers in the same line of business.

No mill could operate where it could not learn from others. No overseer or superintendent could progress without getting ideas from other men. No man's life is long enough for him to learn all that an overseer or a superintendent must know today unless he studies the tried-out experience of other men.

Now, do you begin to see how the endless chain idea applies to us as mill men?

Believe me, it is some chain! I almost get scared sometimes when I think what would happen if COTTON and the other textile magazines were stopped. Or if there were to be on more association meetings for us mill men to attend. And, by the way—just how faithfully are you studying the practical pages of COTTON? Are you just scanning through the pages to see if some particular article fits your case? If you are, the man who is studying *all* the articles, asking questions about them and giving his experience in return, is going to have a better job than you have some of these days.

Only a few weeks ago I met up with a carder who has one of the largest jobs in the South, and he told me he had just had the pleasure of having a man apply to him for a job who was grinding cards when this overseer was trying to get a chance to learn. The grinder would not show him anything, he would not even let my friend see him set up a card; that man "hid his light under a bushel,"

(*Continued on page* 244.)

Our Public Accountants

Their Necessary Service to Progressive Business

No practice in Business is so necessary to logical and safe progress—the keynote of industry today—as that of the Public Accountants.

Organization, System, Method, Control, factors which determine the value of success, depend upon their service.

Theirs the power to make figures talk, telling of *things as they are.* They the guides, and the guards, to progressive action. Thru their efforts, Ignorance, Gamble and Guess are eliminated; Mistakes, Inefficiency and Waste disappear; Profit is assured, and Loss prevented.

The cornerstone of Credit is their *Complete Audit.*

Their monthly *Balance Sheets* and *Operating Statements,* and above all, their *Business Budget,* are the safeguards against Over-Production, Over-Expansion and Over-Expenditure.

They have made *Cost Accounting* a science—and absolutely necessary to manufacturing success.

Inventory troubles are cleared by their simple *Systems.*

Sales Promotion is blind without their *Scientific Market Analysis.*

Tax Problems seem to settle themselves thru their practical knowledge of the law and their understanding of figures.

While their *Business Graphics* put before the executive a moving picture of his business activities.

ERNST & ERNST

AUDITS—SYSTEMS—TAX SERVICE

NEW YORK	CHICAGO	CLEVELAND	INDIANAPOLIS	NEW ORLEANS
PHILADELPHIA	MINNEAPOLIS	BUFFALO	TOLEDO	DALLAS
BOSTON	ST. PAUL	PITTSBURGH	ATLANTA	FORT WORTH
PROVIDENCE	ST. LOUIS	DETROIT	RICHMOND	HOUSTON
WASHINGTON	KANSAS CITY	CINCINNATI	BALTIMORE	DENVER

No "bad cloth" when you weave with "DUPLEX" FLAT STEEL LOOM HARNESS

STEEL HEDDLE MFG. CO.

GREENVILLE PHILADELPHIA PROVIDENCE

Southern Office

509 Masonic Temple Greenville, S. C.

Hampton Smith, Southern Manager

N. B.—We are the sole Manufacturers of nickel-plated drop wires for every kind of loom.

How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects

Fly Frames and Differentials.

EDITOR COTTON:

"Wash's" statement in the November number that the fly frame is a very imperfect machine I think is wrong in some ways. And in justice to the makers I want to say a few things in its defense. I don't consider the fly frame any more imperfect than many other machines in the mill. Machines, in some respects, are like human beings: none of them is entirely perfect. I have operated fly frames or speeders for many years, and I think if a man understands them thoroughly they are no more imperfect than other machines.

The main imperfection in fly frames, I think, is in the cones. I once had a 12 x 6 slubber that, every time the cone belt got to a certain point on the cones the ends would slack right down and many times the operator would have to tighten the ends to run the set full. If I changed the tension gear to make the ends tighter, then the ends would snap off before the set was full. I find much more trouble in these warm sultry days in summer called "Dog Days" with this kind of fly frame than there is at any other time. It is due to the cones not being of the right taper and causing the bobbin gear to slow down too much when the cone belt gets to a certain point on the cones.

Now there happened to be an old slubber in the room that was not in use, so I took the cones out of this slubber and put them in the one that was giving us trouble, and the difficulty was entirely overcome, because the cones were of the right taper.

I think that any carder who has a speeder where the ends run too tight and then too loose while making a set would do well to have the cones changed, and I don't think that the trouble can be eliminated in any other way. There are many things about a fly frame that must be looked after if one is going to operate it successfully. The cone belt should be made of pliable leather, not less than 1¾-inch wide double belting. It should be kept clean, and a little belt dressing put on once in a while to keep it from slipping, as the good running qualities of the speeder depend a great deal on the cone belt.

All slow running parts should be oiled once a week. The lifter shaft and slides, small wheels that the chain runs on, and even the chain, should get a little oil. None of these things should be neglected, for it takes some of the load off the cone belt, if all of the parts work easy.

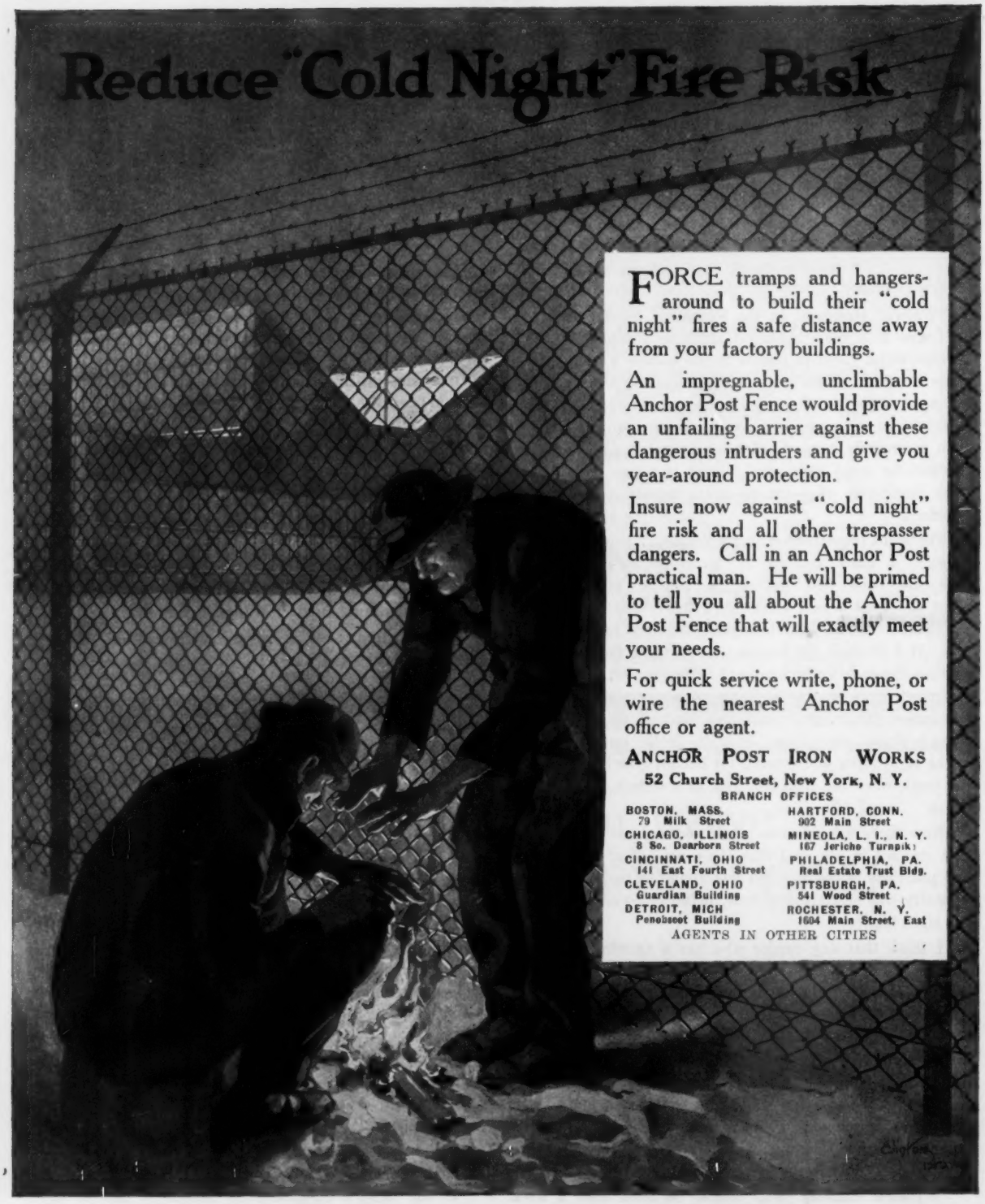
The bobbins should all be of the same diameter, for a bobbin that is smaller than the others will make the end run slack, while one that is larger in diameter will make the end run tight. I think the fly frame gets blamed for imperfect work due to imperfect bobbins, dry slow motions, and improper cone belts, and poor work before it gets to the fly frame. If a man has on the right lifter or lay gear, and the right tension gear, and the draft and twist is right, I can't see why the fly frame won't make as perfect work as the other machines in the carding department.

Some makers of the new differential claim that the cone belt is no longer a driver. I claim that it *is* a driver and a regulator of the speed of the bobbins from the beginning of the set of roving until it is finished, and I do not think that the new differential is any better than the old ones where the sleeve gear runs on a stationary sleeve; this overcomes the friction of the sleeve gear running in an opposite direction to the main shaft. I have both kinds of differentials and I don't think the new ones have anything on the old ones. "Wash" says make this test: Stop a speeder, turn a bobbin gear back a little, making the end slack, then start the speeder and see how quickly the slack is taken up. I admit that it will be taken up quickly, but I do not claim that this is any fault of the fly frame. The slack is taken up more quickly due to the roving being wound on the bobbins more loosely than it would be if it had not been slackened. And I don't think this is positive proof that the roving is being strained. "Wash" knows that when an operative stops a speeder and takes off a little single roving, if only a part of a layer, that the end will stack down for several changes, when the traverse gets to this point, especially on fine work, and many times in damp weather the end will have to be broken back until another new set is started. Is not this good proof that the ends are not being strained much?

If the twist is right and the tension is not too tight, the roving will not be strained much.

One cause of trouble on fly frames is that the mill men demand too long speeders (or too many spindles to the frame) especially the speeder with the weighted rail or carriage. It brings more load on the cone belts and is the cause of many breakdowns due to the greater strain on the horsehead gearing, to drive such long bobbin shafts, and when the set of roving is full on the frame, the load is too great, and if the frames are being run at a high speed,

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.



FORCE tramps and hangers-around to build their "cold night" fires a safe distance away from your factory buildings.

An impregnable, unclimbable Anchor Post Fence would provide an unfailing barrier against these dangerous intruders and give you year-around protection.

Insure now against "cold night" fire risk and all other trespasser dangers. Call in an Anchor Post practical man. He will be primed to tell you all about the Anchor Post Fence that will exactly meet your needs.

For quick service write, phone, or wire the nearest Anchor Post office or agent.

ANCHOR POST IRON WORKS
52 Church Street, New York, N. Y.

BRANCH OFFICES

BOSTON, MASS. 79 Milk Street
HARTFORD, CONN. 902 Main Street
CHICAGO, ILLINOIS 8 So. Dearborn Street
MINEOLA, L. I., N. Y. 167 Jericho Turnpike
CINCINNATI, OHIO 141 East Fourth Street
PHILADELPHIA, PA. Real Estate Trust Bldg.
CLEVELAND, OHIO Guardian Building
PITTSBURGH, PA. 541 Wood Street
DETROIT, MICH Penobscot Building
ROCHESTER, N. Y. 1604 Main Street, East

AGENTS IN OTHER CITIES

FIRM — BECAUSE THEY ARE ANCHORED

Anchor Post Fences

PERMANENT — BECAUSE THEY ARE GALVANIZED

there will be many more breakdowns than would be the case on a shorter speeder with less spindles.

Imagine a long speeder with 184 or 200 spindles running with dry slides, the small wheels that the chain runs over nearly stuck, and the rail carriage jumping along due to this condition of things. Is it any wonder that there is trouble with speeders? For the cone belt drives the carriage, and these things make it more liable to slip, and it is more apt to slip on a long speeder than it is on a short one with less spindles. I know that the long speeder has one advantage to the mill. Most mills where I have worked do not pay any more per hank for running speeders with 184 to 200 spindles to the speeder than they do for running a pair of speeders with 152 to 160 spindles to the speeder, and an operative on the long frame will not get as many hanks per spindle, due to its being stopped more to piece up ends and taking longer to doff than the shorter ones. But the operative on the longer speeder will get off more pounds due to running so many more spindles and this makes the cost per pound in favor of the longer speeder. That is all I think there is in favor of speeders with so many spindles.

Some years ago when I took charge of a room, the jack speeders in this room were long—184 spindles to the speeder—and about every time the operative started a frame up, the ends would slack down and some of them would fly out of the flyers due to the cone belt slipping when starting up the frame. The carder before me had weighted the bottom cones to make the cone belt drive better, which I think is a very poor idea, because it brings more strain on the cone belt and makes it break more often. I removed the weights from the bottom cones, put on new cone belts made of good, pliable double belting, made endless and sewed. By the way, it is quite necessary to *sew* belts made of double belting, for they would soon come apart when running on the cones if they were merely cemented together.

Before putting these belts on it was necessary to start a speeder very slowly or the ends would slack down and fly out of the flyers. After these belts were put on the operator could ship the driving belt onto the tight pulley as quickly as desired and the ends would not slack or fly out of the flyers.

Mr. Carder should pay a little more attention to these things, and not blame so much onto the machine. And as "Wash" poetically put it in the November number, "Don't tell me that this world is unkind; it's not the world. It's you." And in this case it's not the speeder, "it's *you*."

All carders know that many times an operator will come to him and say, "I can't do anything with those damn speeders; you'll have to put someone else on them." The boss does so, and in a short time, after the new operative gets them straightened out, you will find him sitting down and taking things easy. The trouble is not always in the speeder, more often it is in the operative. The man in charge must know his business, and so must the operative know his.

"Wash" says that we must all admit that the fly frame is a long way from being perfect, due to its good work depending on a small piece of belting—the cone belt. Well, *I* for one do not admit such to be the case. Let the carders get on the right kind of cone belts and then keep them carded off, and the right kind of belt dressing on them, and there will not be so much trouble. I have seen cone belts running that looked as if they never were carded off, and were all soaked with oil. And then we blame the speeder and claim it is a very imperfect machine.

"Wash" claims that the cone belt must drive the bobbin gears at a speed in excess of the spindles without any aid from any other source. I claim that the cone belt receives aid from the fixed gear (or tight gear) on the main shaft, the one that meshes with the two gears inside of the sun wheel. This gear helps to carry the load of the cone belt. I admit that the cone belt must carry the bobbins at a speed in excess of the spindles in order to wind on the roving. The cone belt regulates the speed of the bobbin gears by driving the sun wheel with its two gears inside, around the sleeve gear, and this fixed or tight gear on the main shaft. But this gear helps to carry the load. The cone belt drives the rail or carriage without any aid from any other source. It would be impossible for it to drive the bobbin gears too, without any assistance from any other source. "Wash's" statement that the flyer-lead makes better work than the bobbin-lead, I think, cannot be proven very well. If it did make better work why was it thrown out and the bobbin-lead frame put in? I don't see why the flyer-lead wouldn't be just as liable to strain the roving as the other kind. If the tension was run a little too tight, or as "Wash" says, the presser pad helps out the cone belt by its pressure on the bobbins helping to carry the bobbin gears along—if that is the case why won't the roving be strained just as much as it would be with the bobbin-lead frame?

And now before closing these remarks on the fly frame, I want to say that the cone belt doesn't need any helping out if it is of the right kind and is taken care of. It doesn't need any help any more than some fly frames I have seen need four cones—two top and two bottom—and no speeder needs four cones any more than a dog needs two tails. The cone belt will do the work which the makers of speeders intended it should do, and do it well, if it is of the right kind. There is a kind of cone belt made of canvas, but it is too thin and light to drive well, and after it has run a short time it will have a smooth, glazed surface, and every time the speeder is started up the belt will slip and the ends will slack down.

Now just a few more words about this compound motion. This seems a hard subject to write about and make one's meaning clearly understood by others. I think one could compare the load carried by the cone belt and compound motion to a mill where the main lines of shafting are driven by water wheels and engines, driving the main lines of shafting all belted together. The wheels alone haven't the power to drive the mill, neither have the engines. The regulating of the speed is done by the engines alone. If one puts on more machinery the regulator acts and brings the speed up to standard. Now could it do this if the engine alone hasn't the power to carry the load? Could the cone belt, when called upon to increase the speed of the bobbin gears, do so without the aid of the tight compound gear on the main shaft of a speeder helping to carry the load of driving the bobbin gears?

I may be wrong, but I don't think I am, at least not any more so than the makers of the new differential motion when they claim that the cone belt is no longer a driver.

Are you still in the age of bolts and rivets?

You are, if you are using them to join your tank edges, pipe ends and plates.

Modern industrial processes demand improved methods and *Oxwelding* provides them.

In the upkeep of machinery Oxwelding is also indispensable, remaking worn and broken parts at a nominal expense and with scarcely no lost motion. In salvaging old parts and in effecting quick repairs, it is saving industry a mighty toll.

The same Oxweld outfit with slight adjustment, welds metals or cuts them.

Oxweld, the world's largest makers of Oxy-acetylene welding and cutting equipment, with its great organization of engineers and metallurgists, stands ready to aid with practical engineering advice, without cost, no matter what methods or equipment you are using.

Our vast experience is at your service—let us study your problems and point out Oxweld short-cuts to economy.

Oxweld Resident Engineers, stationed in more than fifty important cities, are ready to work with you.

OXWELD ACETYLENE COMPANY

Newark, N. J. Chicago San Francisco

Oxweld

WELDING AND CUTTING APPARATUS

World's Largest Manufacturers of Welding and Cutting Equipment

I think it is a driver, just as much so as it is with the old compound motion. K. C. (Conn.)

A Discussion on Slashing.

EDITOR COTTON:

After reading carefully the discussion on the relation of the various processes in the mill to better goods, brought up at the Greenville meeting of the Southern Textile Association, as reported in the November number of COTTON, I believe that these discussions should be of great interest to all cotton mill men, no matter what positions they hold.

Of course some of the suggestions are very good, if fully understood—for instance, take spooling, warping and slashing. In many mills these operations are slighted very much; the sole object being production; and different overseers have diametrically opposite ideas of the best procedure to attain good weaving results. If in a large white goods mill, and the management is desirous of having the yarn properly taken care of in these three processes, I would suggest leaving both the spinning and weaving overseers out entirely; then the boss slasher can go to the spinner when things do not come as they should, and if the warps are not up to expectations in reaching the looms the weaver can have redress by calling on the slasher overseer and explaining the trouble.

Getting back to the report in November COTTON, on page 16 Mr. Williams speaks on slashing, and the making of size. Now do we understand Mr. Williams to mean that all differently picked goods and the more threads per inch in the warp would have to be a different formula for making size? I am inclined to believe that the know-how of operating a slasher has much to do with producing good warps with one formula instead of two. If the two constructions Mr. Williams names are made from the same number of yarn, my idea is that if we have a set of 32s/1 1816 ends, sizing and drying correctly at a given speed for 60 picks, then I can see no reason why a set of 32s/1 2,030 ends driven slower on the slasher with the size penetrating the yarn more than on the lighter set will not be able to stand the extra picks. I know from experience on chain warps that thin sizes gives the best results by sizing and then drying, repeating this twice, as against a thicker formula done in one run. On any kind of dressing the longer the yarn can stay in the box the more size is retained in the yarn.

I can agree that the tension is all-important on slashing, and that cylinders should run easily, but I can't get Mr. Williams' idea for having to change the speed on the size rolls. He states that he finds this necessary to do at times, and that it delivers the yarn faster, and to take care of the extra yarn he builds up the tension front roll. There is something radically wrong in such a statement for the one reason that there are no gears to change the speed of the size rolls. When one desires to run a slasher fast or slow he operates the cone belt up or down, but if there is not a cone on the machine there will be a change gear on a shaft where the cone should be. This make of slasher is a positive drive, and according to the desired speed. The only time that the yarn will be delivered through the size rolls faster than the front friction roll will take care of it is when one changes to a much heavier construction, such as the set previously mentioned. As 1,800 ends is okeh, then 2,200 ends of same yarn will naturally go through the size rolls faster than 1,800 ends, no matter what the general speed of the machine is, so the time is now to have the piece of cloth all ready to put on as the heavier set begins to leave the size box.

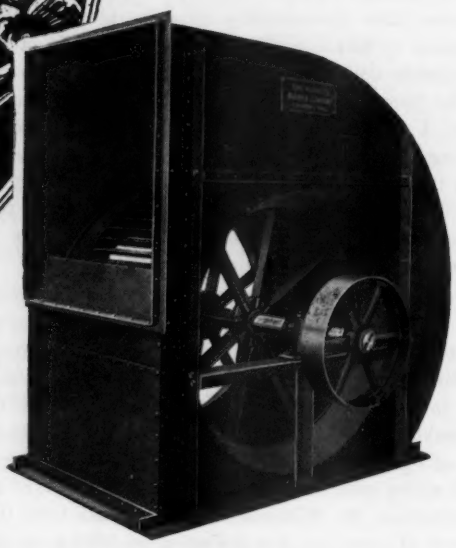
In mills where the goods are varied in construction from thin to very heavy sheets, the slasher men keep on hand a number of pieces of cloth of different lengths, and know just about what length will do for the change they are going to make, and if changing from heavy to light construction they can judge how much cloth to take off to get the proper tension. No slasher tender need have any fear of ever pulling the cylinders with a tight friction, but he will pull his warp apart, as has often been done when starting a new loom beam by neglecting to loosen the friction plates enough. I can't see anything like a lease on a slasher which many men use when speaking of the section divisions. There is such a thing on a tape dresser, which machine as a rule has but one cylinder and is sometimes used as a slasher in the ordinary way, but in taping the yarn is run through a hook lease reed, two ends in dent, taking a single thread lease on each loom beam, and the section beams are all run from the top; this system is growing less on account of the tying-in machines.

I have had a good deal to do with the dressing of warps—white and colored, fine and coarse yarns, heavy and light sets. My experience has been if I desired to produce a warp worth going into a loom—say 3,000 ends, eight beams in the set—I would take a little longer time to get it going on the slasher by placing the first four section beams in the stands the regular way: first bottom, second top, third bottom, and fourth top. Then with my next four section beams miss the bottom stand, putting the fifth on top, sixth on bottom, seventh on top, and eighth on bottom; then put the first four beams through each other; next put the last four beams through each other; but instead of the eight beams being all in one sheet, run the back four over the top of the front four making two separate sheets; then put the strings in as usual; having a good straight sheet ahead of the strings for a few yards; then run through to the front; center string to be just over the tin roll, slip the center rod in—an ordinary slasher comb 400 dents, laid in eight threads in dent—take four ends from each shed. When laid in, pick up the bottom four ends all across, put in a flat steel rod about 1 x 3/16-inch beveled edge, then put in another rod of the same size between the top and bottom sheds; tie or have small pins made to hold these rods just on the front of the comb, each about 1½-inches apart. (Put rods in the other sections in the usual way.)

The yarn comes over these rods and stays in position and if beams are warped properly there is not much danger from anything else. The idea of running the beams as two sets is that it eliminates any chance of yarn from one half going in with the other half; it will not cling together as the middle section does when the beams are all laced up into one sheet.

With reference to the angle tooth and double combs, they are very good, but if one uses a double comb with a very heavy set he isn't any better off nor as well off in regard to the breaking of the threads. I had occasion a

Saving Coal



THE question of fuel is the all-important question today. If we can get it, the next thing is to make it go as far as possible.

Operating boiler at rating is not economical—neither is natural draft economical. And it's not economical to burn high-grade coal.

Controlled forced draft is the thing that you need to make your coal go further. The boiler equipped with Buckeye Blowers is independent of weather conditions and fuel quality. A call for more steam means merely turning on the blower. A Buckeye Blower will effect real economy in your boiler room—more steam with less fuel, and with the *cheapest grades of fuel.*

Buckeye Blowers cost very little to install. We will be glad to send our representative to your mill and advise with you as to just what is needed, whether it is for forced draft fans or for heating, ventilating or cooling systems.

Write us direct or our branch offices.

BUCKEYE BLOWER CO. COLUMBUS, OHIO

372 Whitehall St., Atlanta, Ga.
324 Monadnock Block, Chicago, Ill.
501 Wabash Bldg., Pittsburgh, Pa
1400 Broadway, New York, N. Y

BUCKEYE

FANS and BLOWERS

BUCKEYE Products

Include all types of equipment for heating, cooking, ventilating and blowing.

DISC FANS AND BLOWERS
MULTIBLADE FANS
EXHAUSTELS
HEATOVENTS—UNIT HEATERS
HEAT AND VENT GRILLES AND GUARDS
DRAFT CHECK DAMPERS
LOUVRE DAMPERS
ANGLE MIXING DAMPERS
AIR DIFFUSERS
CAST IRON DOORS
ROOF VENTILATORS
FLOOR OUTLETS
DAMPER OPERATORS
WALL TIES, ETC.

few years ago to be at a colored goods mill in South Carolina where there were two slashers, one had a double toothed comb and the other an ordinary 300-dent raddle, on all kinds of pattern work from one by one up. I ran the machine with the old comb and using flat rods in front of the comb, and this machine turned out better work and more of it. These sheets were laid in as stated. The machine with the fine double comb had more smashes from ends breaking at the comb.

What makes sets run out unevenly? As Mr. Williams replied there are many causes, and even if a slasher man got a full set from one warper and does not see to the placing of the beams right as to easy running and putting the proper amount of weight on each beam according to its position, he will have waste. Getting the sets from different warpers has something to do with excessive waste, but a slasher tender's judgment has a great bearing on the amount of waste made.

I have a question regarding the cause of waste on slashers. Mr. Harris stated that he believes the warpers are the trouble-makers in the waste problem to a large extent. He claims that worn skewers on a warper will indicate more yardage on a section beam than a machine with good skewers. The only difference I can see is that where the pegs are smaller the beam is naturally a little harder; the yarn hugs the measuring roll fully better than one running lighter, and can only indicate the yards that pass over it. Mack (Ga.)

A Fly Frame Twist Problem.

EDITOR COTTON:

In reply to the letter of "Wash" in the October issue of COTTON, I would like to say first for his benefit that the few remarks I made in the August issue were headed "Long and Short Card Drafts" by the editorial force of COTTON. I wrote them and headed them as "A Few Remarks." That is all they were and all they were intended to be. They were my ideas—worth that much and no more. They were prompted by various letters on long and short card drafts, one and two process drawing and picking, etc. I hope this partially explains the things "Wash" was wondering about. I did not ask the questions with the idea that "Wash" could not answer them, nor with the idea of causing him any worry, nor to prove him wrong. I could not see his point on escaping twist and, being like himself always looking for information, I asked the questions with the idea of trying to see it as "Wash" does. I am afraid, however, that I was misunderstood, from the tone of "Wash's" reply. But let that pass.

In regard to the law of compensation, I did not know but what it might be something new. I never had heard of it in just that way. But some years ago, when I took my first carder's job, the old "super" that gave it to me said, "What you get out of this room depends entirely upon what you, personally, put into it. And remember, 'As ye sow, so shall ye reap.' " It is the law of compensation expressed in different language.

"Wash" is correct in saying I recommended a 12-ounce lap in a previous letter, and absolutely wrong in saying I advocated an 18-inch lap in my August letter. (I presume he means to convey the impression that I favor an 18-ounce lap over a 12-ounce lap in all cases.)

I repeat here that I have been able to make an 18-ounce lap that was more even as to weight per running yard and more even as regards thick and thin places than a 10-ounce lap is even in these characteristics. (In answer to my previous letter on the 12-ounce lap, didn't "Wash" himself say that I should watch for thick and thin places and look out for holes?) So I say that, with a long card draft, which "Tom" says requires a more even lap than a short draft, why worry about the more even lap required? It should be secured with the heavier lap necessary, anyway. That is no reason why more of us use short card drafts.

This 18-ounce lap which I made was of China cotton and was to be made into 120-grain card sliver for the woolen trade. And when I made it I could spare just so many cards that, with the lappers, had to be taken from other work. And of course the spinning room ran as many spindles as usual. And that 18-ounce lap was a beauty.

Now don't say that I said I made a 50-grain sliver from an 18-ounce lap in the August issue, for if you read it carefully you will see that I didn't. As I remarked in that letter, all things are relative. How a thing is done depends upon what you decide is the best procedure under given circumstances, and what you have to do it with and not upon what may be the most ideal method.

If the edges of "Tom's" 18-ounce lap weigh the equivalent of a 36-ounce lap, then the edges must be twice as thick as the middle. I should think that the feed roll would, under such conditions, be raised enough to allow the licker-in to "snatch in." Does "Tom" have any such trouble, and how does he prevent it?

In regard to my question on escaping twist, I must say that I am still in the dark. Perhaps "Wash" means something different than his words give me to understand. That is what I don't know and would like to find out.

For instance, if twist escapes in the opposite direction to the incoming strand it must run back towards the front rolls. Then I don't see but what it is trapped, for it cannot pass the front rolls, and cannot pass the bobbin and so cannot escape, but must stay between the bobbin and front rolls where the twist is inserted into the strand as delivered.

I understand what mechanical efficiency is. I presume that "Wash" means that with a certain twist gear we should get a certain twist per inch; and, because we cannot show that twist per inch on the finished roving, then the mechanism is only a certain per cent mechanically efficient and the percentage of inefficiency is equal to that percentage the so-called escaped twist bears to the twist per inch as figured from the twist gear.

Do I understand "Wash" to mean that if it was possible to have a pair of rolls at the end of the presser paddle which would pinch the roving as firmly as between the drawing rolls and deliver it to the bobbin, then there would be no lost twist?

If that is what he means, how would that prevent the twist from escaping in a direction opposite to the incoming strand?

Is it a fact that one complete turn of the flyer will insert one turn of twist into a strand of roving?

Isn't there always a certain "drag" or "tension" or "draft" or whatever you may call it, between the front roll and the bobbin?

EDWARD A. STUHRMAN

Mem. Am. Soc. C. E.
Mem. Am. Concrete Institute.

Candler Annex, Atlanta, Ga.

General Structural Engineering
In
Steel and Reinforced Concrete

Industrial Plant Layouts.

Warehouse—Factories—Commercial Buildings.

Accurate Preliminary Estimates of Cost.

Appraisals. Reports.

Is it not a fact that the flyer inserts twist into the strand as it is wound onto the bobbin and to figure the actual twist per inch in the roving should not the length wound onto the bobbin be considered and not the length delivered by the front rolls?

Let us assume that 100 inches of roving are delivered by the front rolls of a fly frame. Let us assume that the spindle (or flyer) makes 100 revolutions while this 100 inches of roving is being delivered. Then theoretically we should have one turn of twist per inch of roving.

Now let us assume, taking into consideration contraction, tension, and all other factors having any influence on the length wound, that 102 inches of roving are wound onto the bobbin while the front roll is delivering 100 inches and the flyer makes 100 revolutions. Under these conditions, what would be the twist per inch of the finished roving on the bobbin?

How many total turns of twist would the 102 inches of roving wound contain?

I would like to have "Wash" answer these few questions and would especially request him not to misconstrue my meaning in any of them. I have tried to make them clear and plain and when I have meant twist per inch I have specifically stated so and when I speak of one turn of twist or total twist in a strand that is what I mean and nothing more. S. A. F. (R. I.).

Does the Licker-In Comb the Stock?

EDITOR COTTON:

"K. C. (Conn.)," in his article entitled "Uneven Yarn and Other Things," which appeared in the October issue, is very practical and instructive in the first twelve paragraphs, but instead of stopping here, he continues and rather detracts from this instructive discussion by what he says later on.

In the 13th paragraph, he claims that uneven work makes some of the bobbins of roving soft and some as hard as a brick. His idea of a fly frame is as near right as his idea of a long draft on a card, in my opinion. The average variation in the sliver or roving will not make a bobbin as hard as a brick. Rolls set too close or dry rolls will do so.

Soft bobbins are sometimes caused by not having the presser properly adjusted to the hollow leg of the flyer, making it unable to respond to the speed of the spindle.

And in the 14th paragraph, "K. C." is asking a question that helps to prove the fly frame the most imperfect machine in a cotton mill, as I have claimed. He should have asked, what makes a set from any fly frame run out uneven? Why, the answer is easy. You can overcome the trouble by removing the frictional contact between the front steel and top leather rolls and help make the fly frame more perfect. However, it is very hard to do, and it is farthest from my mind to even try it.

In his 15th paragraph, "K. C." mentions the questions put to me by "S. A. F. (R. I.)" and in the 16th paragraph, he says, "I think that 'Wash' will answer the questions all right." I have, already. I answer all questions to the best of my ability—unlike "K. C." who overlooked my most vital questions propounded in the August issue, viz., (1) If a sheet of lap is uneven, why is it that it runs well in the case of a short draft, as 'Tom' admits in his letter?" And please have "K. C." answer the second question, for it is very important: "If a long draft is not the cause of wearing the licker-in teeth on each end, what does this?"

Let him forget questions 4 and 5.

"K. C." attempts to answer question 3 and asks in the 22nd paragraph of his October letter, "Then if that is the case, why couldn't the heavy lap, long draft boys have their lickers-in made just a grooved drum, without any teeth in it?" Here's why: the teeth play through the hanging fringe of lap and sink into it, and by the spiral arrangement of the fillet, the sheet or fibers are detached in clusters due to the high surface velocity of the licker-in.

If the licker-in was just a grooved drum, the following would happen: First, it would not break and enter the sheet of lap, and, second, if it did it would hold and carry the stock around the second time.

"K. C." springs a good one in the 21st paragraph. He states, "I think that 'Wash' is wrong and 'Tom' is right." Please get "K. C." to perish this thought. Continuing, he says, "Let 'Wash' stop the feed on a card and turn the lap out of the feed roll by turning it backwards and then examine the lap; he will find the tufts of cotton all straightened out and separated, hanging in a fringe from the thick part of the lap. If the fibers haven't received a kind of combing action from the licker-in teeth, then I don't know what you would call it." Call it a trimming.

"Wash" can stop a blade beater and find the same condition, surely "K. C." does not claim a carding action from a blade beater! Again, let him examine the fringe acted on by either the bladed or carding beater, and he will find no difference.

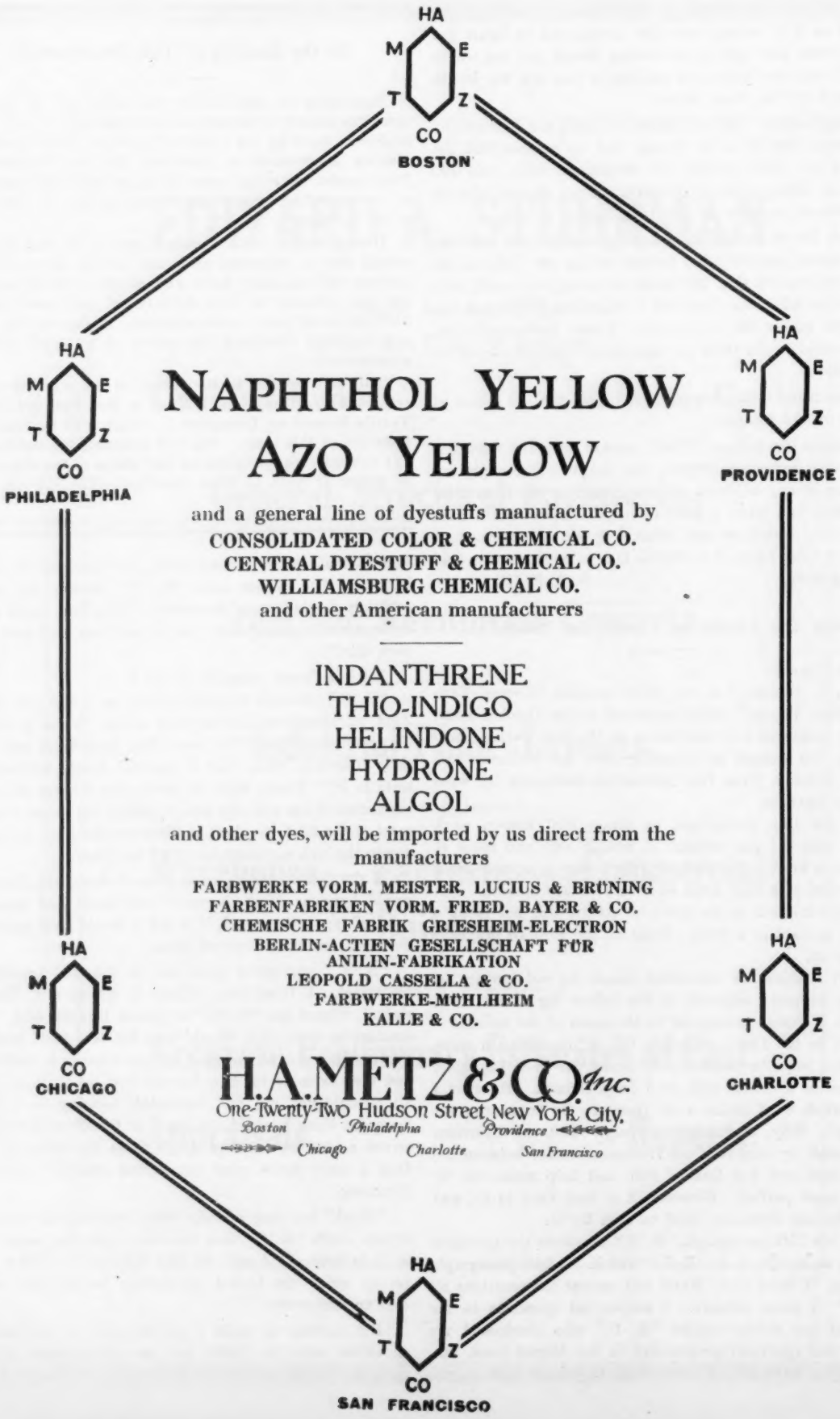
But pardon me while I call attention to the fact that in either case the fibers are not straightened out any more than in the case of the licker-in. Wash. (R. I.)

To the Readers of This Department.

Beginning on page 173 of this issue will be found a complete report of the discussion meeting on card room problems, held by the Carders' Division of the Southern Textile Association at Anniston, Ala., on December 8. This report, covering some 13 pages, gives the opinions of the operating executives of that section as expressed at the meeting.

If any readers who were not present at this meeting would like to comment upon any of the discussion, or express any opinions upon any of the subjects brought up, the columns of this department are open for the publication of such communications in the regular manner, without divulging the names or mills of the correspondents.

This also applies to the report of the meeting of operating executives of Fall River at the Bradford-Durfee Textile School on December 5, which will be found on page 196 of this issue. We will welcome for publication any remarks from readers on any phase of the discussion at either or both of these meetings.—The Editors.



NAPHTHOL YELLOW
AZO YELLOW

and a general line of dyestuffs manufactured by
CONSOLIDATED COLOR & CHEMICAL CO.
CENTRAL DYESTUFF & CHEMICAL CO.
WILLIAMSBURG CHEMICAL CO.
and other American manufacturers

INDANTHRENE
THIO-INDIGO
HELINDONE
HYDRONE
ALGOL

and other dyes, will be imported by us direct from the manufacturers

FARBWERKE VORM. MEISTER, LUCIUS & BRÜNING
FARBENFABRIKEN VORM. FRIED. BAYER & CO.
CHEMISCHE FABRIK GRIESHEIM-ELECTRON
BERLIN-ACTIEN GESELLSCHAFT FÜR ANILIN-FABRIKATION
LEOPOLD CASSELLA & CO.
FARBWERKE-MÜHLHEIM
KALLE & CO.

H. A. METZ & CO. Inc.
One-Twenty-Two Hudson Street, New York City.
Boston *Philadelphia* *Providence*
Chicago *Charlotte* *San Francisco*

The Efficient Weaving Overseer.

EDITOR COTTON:

I suppose that in outlining the duties as I see them of an efficient weaving overseer, I am treading on dangerous ground and am likely to bring down the wrath of others upon my head. But I shall try to outline these duties in a clear, concise manner, and, as I have had a number of years to my credit at this calling which were by no means unsuccessful, I feel that I can speak from experience. The writer during his days as overseer was head of the weaving department in one of the large New England mills for a period of seven years.

In the first place, I wish to say that an overseer, in order to be successful as such, must have in mind the producing of his particular product at the very lowest possible cost per pound. This does not mean that his attitude must be miserly or stingy, because as a rule this type of man is not successful. But I mean he must strive to produce the highest possible number of pounds for the amount expended in the operation and upkeep of his department. Bear in mind this fact: that it is not the man who spends the least in the running of his department who is the best and most efficient overseer, but rather the man who has for his aim the producing of the largest possible number of pounds for the amount expended in keeping his department running in an efficient manner, or in other words the man who when his costs are divided by the pounds produced, shows the smallest remaining figure—this, to my mind, might well be termed economical efficiency.

In order to do this in a thorough and efficient manner, it is very necessary for the overseer in charge to have a clear and accurate method of obtaining the cost per pound to be charged against each individual type of operative in his department, and in order to do this it is necessary to proceed in a thorough and careful manner. The first operation in this respect is the making out of a list of operatives, sufficient in number to operate his department well and intelligently, taking care that he does not be so generous as to produce a lot of those soft snap jobs we often hear about and very often see.

In order that this article may be made as clear as possible, I shall take as a means of illustration a mill with 1,000 looms, which shall be automatic looms running on medium counts of yarn, producing such goods as velveteens, corduroys, moleskins and sateens. The number of looms on each type of goods to be as follows: velveteen, 200; corduroys, 400; moleskins, 200; and sateens, 200. There will, of course, be the average number of day hands, known as nonproductive labor, it being necessary to split up the various groups of looms on the different styles into their respective sections, each section representing the number of looms to be taken care of by a loom fixer, these being divided as follows:

LOOMS PER SECTION.

Velveteen	100 Looms	2	Loom Fixers
Corduroys	80 Looms	5	Loom Fixers
Moleskins	80 Looms	2½	Loom Fixers
Sateens	80 Looms	2½	Loom Fixers
Total		12	

In regard to the number of second hands, two ought to be ample for this number of looms. Now, having made the principal divisions, we shall proceed with the day work pay roll and show the rest of the divisions thereon. An innovation in this respect will be the columns showing the cost per loom of each individual operative.

WEAVE ROOM PAY ROLL.

DAY WORKERS.

Occupation	Number of Hands	Rate Per Hour	Hours Per Week	Amount	Total Amount	Cost per Loom Per Operative
Overseer	1	.7272	55	40.00	40.00	.033333
Second Hands	2	.60	55	32.00	64.00	.053333
Loom Fixers	12	.5272	55	30.00	360.00	30
Smash Piecers	4	.40	55	22.00	88.00	.073333
Filling Carriers	4	.2909	55	16.00	64.00	.053333
Cloth Carriers	1	.3272	55	18.00	18.00	.015
Loom Cleaners	8	.2545	55	14.00	112.00	.093333
Scrubbers	2	.2181	55	12.00	24.00	.02
Totals	36				770.00	.641665

It will be seen by the day pay roll that the total cost per loom is approximately .64, while the cost per operative is shown also.

In regard to the number of operatives, it may be remarked by some overseers that the number of hands is fixed by the superintendent or agent and that there is no hope of changing this set number, but I know from experience that this is not so, and let me say right here that the man who is willing to cooperate with his superiors in keeping down costs, will not want for assistance in this direction. The main trouble has been, and no doubt still is in many instances, that the inefficient overseer goes to work and in order to save a little trouble for himself, sur-

REQUEST FOR NEW WEAVING PRICE.

Style	U. C. -26	Looms Per Weaver	16	Hours Per Week	55
Pick and Sley	60 x 200	Loom Speed	165	Base Rate	$24.00
Warp and Filling	12 & 25	Est. Production	90%		
Reed width	36¼"	Yards Per Pound	1.75		
Yards Per Cut	60				

Please authorize new weaving price for above style as per figured estimate.

$$\frac{165 \times 60 \times 55 \times 16 \times .90}{200 \times 36 \times 60} = 18.15 \text{ cuts per week}$$

$24.00 \div 18.15 = \$1.32$ Price Per Cut

J. JONES, *Overseer.*
W. RIGNOR, *Superintendent.*
P. STICKNEY, *Agent.*

R&H CHEMICALS

Each month we issue a partial list of the R. & H. products, showing price changes and commenting on special market features.

This list includes many of the chemicals used by the textile industry. It is used regularly by thousands as a guide in the purchase of materials.

We shall be glad to include the name of any one sufficiently interested to write us on his company's stationery.

NOVEMBER 1922
(No. 402)

40th YEAR
FOUNDED 1882

The
INCORPORATED 1899

ROESSLER & HASSLACHER CHEMICAL CO.

709 SIXTH AVE. Corner 41st ST. NEW YORK
(P. O. Box 119 Times Square Station).
Telephone Pennsylvania 5648 — Cable "JIGDA" New York

WAREHOUSE FOOT of 39th ST. SOUTH BROOKLYN

CHEMICAL WORKS
Perth Amboy, N. J. — St. Albans, W. VA.
(The Pacific R & H Chemical Corporation) LOS ANGELES, CAL.
ELECTRO CHEMICAL WORKS
(Niagara Electro Chemical Co.) NIAGARA FALLS, N. Y.

ADDRESSES	SALES OFFICES	TELEPHONES
40 Central St.	BOSTON	Main 6260
230 E. Ohio St.	CHICAGO	Superior 7926
607 Hanna Bldg.	CLEVELAND	Cherry 717
2018 Gilmotte Ave.	KANSAS CITY	Main 6240
613 Louisiana Bldg.	NEW ORLEANS	
860 Drexel Bldg.	PHILADELPHIA	
307 Fulton Bldg.	PITTSBURGH	Bell-Lombard 4129
625 Market Street	SAN FRANCISCO	Shetfield 1029
		Sutter 4864

SULPHIDE OF SODIUM—*Conc. and Crystals*
ALUMINUM SULPHATE—*iron free 17--18%*
ANTIMONY SALTS *65%*
SODIUM NITRITE—*96%*
SODIUM ACETATE
OXALIC ACID—*German and Norwegian*
ZINC DUST
FORMIC ACID 90% MINIMUM
EPSOM SALTS—U. S. P. AND TECH
BISULPHITE OF SODA—*Anhydrous*
FORMALDEHYDE U. S. P.
CYANEGG—CYANIDE OF SODIUM
BICHROMATES—*Soda and Potash*
GLAUBER'S SALT
BARIUM CHLORIDE—*White Crystals*
CARBON TETRACHLORIDE

The ROESSLER & HASSLACHER CHEMICAL CO.
709 Sixth Ave., New York

PIECE WORK PAY ROLL.

NAME	Style	Cuts	Style	Cuts	Style	Cuts	Style	Cuts	Hours Worked	Looms Per Set	Price Per Cut	Amount	Per Cent. of efficiency
John Loomis	V-4	7							55	25	$3.955	$27.68	88½
Robert Catlin	V-4	7½							55	25	$3.955	$29.66	95
Joseph Woods	V-4	6¾							55	25	$3.955	$26.70	85¼
Charles Mader	V-4	6¼							55	25	$3.955	$24.72	79¼
John Monsoon	V-4	6							55	25	$3.955	$23.73	76
Albert Cleary	V-4	7¼				.. ..			55	25	$3.955	$28.96	92
Anson Shuron	V-4	7							55	25	$3.955	$27.68	88½
William Manson ...	V-4	6½				.. ..			55	25	$3.955	$25.73	82½
Martin Clemson			C-62	20					55	20	$1.25	$25.00	94
George Ketrell			C-62	18					55	20	$1.25	$22.50	84½
Alvin Kitson			C-62	19½		.. ..			55	20	$1.25	$24.38	92
Joseph Cleary			C-62	19					55	20	$1.25	$23.75	89
John Boyd			C-62	20½					55	20	$1.25	$25.00	96
William Clemens ...			C-62	18½					55	20	$1.25	$23.13	86¾
Jonas Culver			C-62	17			....		55	20	$1.25	$21.25	79¾
Jarus Stinton			C-62	17½					55	20	$1.25	$21.88	82
Fred Jones			C-62	21					55	20	$1.25	$26.25	98½
Alfred Stone			C-62	18					55	20	$1.25	$22.50	84½
Harry Barrows			C-62	19					55	20	$1.25	$23.75	89
George Barrett			C-62	20					55	20	$1.25	$25.00	94
Wilson Johnson			C-62	20¼					55	20	$1.25	$25.31	95
Harold Winsor			C-62	17					55	20	$1.25	$21.25	79¾
Charles Collett			C-62	17½					55	20	$1.25	$21.88	82
Charles Johnson ...			C-62	20					55	20	$1.25	$25.00	94
Aaron Wellman			C-62	21					55	20	$1.25	$26.25	98½
George Grace			C-62	20					55	20	$1.25	$25.00	94
David Teller			C-62	19					55	20	$1.25	$23.75	89
Tris Gascoigne			C-62	18					55	20	$1.25	$22.50	84½
Aria Stimpson					M-18	20			55	14	$1.32	$26.40	97¼
Jerome Davis					M-18	18½			55	15	$1.32	$24.42	80¾
Wilfred Ames					M-18	19			55	14	$1.32	$25.08	83
Melvin Jamieson ...					M-18	20½			55	14	$1.32	$27.06	89½
Cecil Jerome					M-18	21			55	15	$1.32	$27.72	91¾
Alton Davidson					M-18	18			55	14	$1.32	$23.76	78½
Leroy Daniel					M-18	17½			55	14	$1.32	$23.10	76¼
Edward Cardus					M-18	19½			55	14	$1.32	$25.74	85
Harold Bancroft ...					M-18	20			55	15	$1.32	$26.40	87¼
David Cames					M-18	21			55	15	$1.32	$27.72	91¾
Joseph McGee					M-18	20½			55	14	$1.32	$27.06	39½
Arnold Seewald					M-18	18			55	14	$1.32	$23.76	78½
Arthur Elwood					M-18	19			55	14	$1.32	$25.08	83
James Parrot					M-18	19½			55	14	$1.32	$25.74	85
Gerald Manning ...							S-8	35	55	20	$0.671	$23.49	86½
Fred Stone							S-8	36	55	20	$0.671	$24.16	88½
John Stanley							S-8	34	55	20	$0.671	$22.81	83½
Henry Canwell							S-8	32	55	20	$0.671	$21.47	78¾
Robert Standwood .							S-8	34½	55	20	$0.671	$23.15	84¾
Stanley Rhodes							S-8	35½	55	20	$0.671	$23.82	87¼
George Rawley							S-8	36	55	20	$0.671	$24.16	88½
Harvard Kenwood .							S-8	35	55	20	$0.671	$23.49	86½
Jonas Barry							S-8	34	55	20	$0.671	$22.81	83½
Jarus Crossley							S-8	33	55	20	$0.671	$22.14	81
Totals.....	V-4	54½	C-62	380¾	M-18	272	S-8	345	55	1000		$1,281.36	

rounds himself with a lot of unnecessary hands who do no good and only help to swell the pay roll, which in a good many cases is already sadly overburdened. This condition has led to the superintendent taking matters in his own hands and absolutely forbidding the overseer to hire any more hands over a certain number—and it is right that it should be so.

My superintendent was one of the best known mill men in New England, as well as one of the most practical men with whom it has been my good fortune to be connected. He would quite often send for me or come to my office on his rounds, when we would discuss these matters, the result of this being that we understood each other and if I could get along efficiently with less hands, I certainly would do so, but if I needed any extra hands there was no argument, as long as my cost per pound was right.

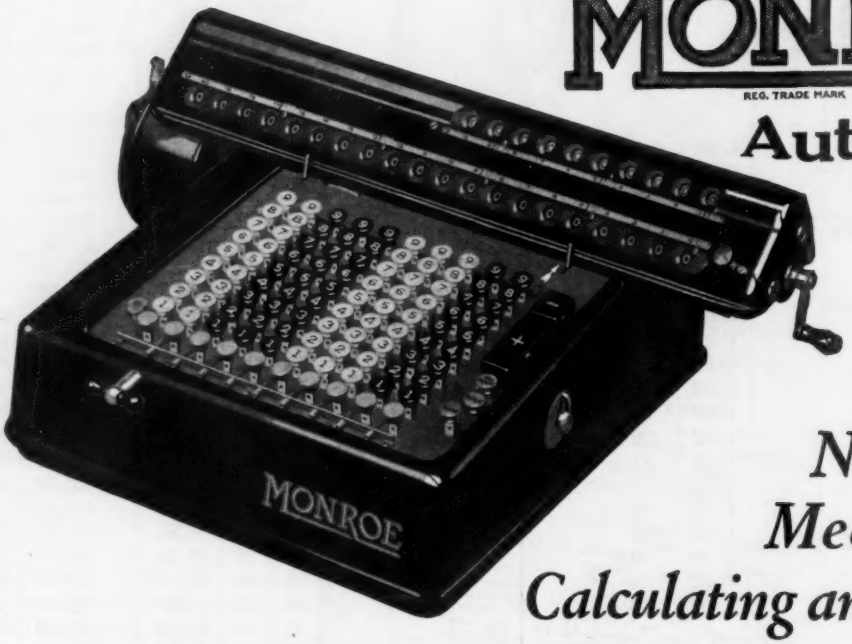
In sending in a request for a weaving price on a new style, we made out a form as follows which was sent to the office, there to be checked by the superintendent and returned to us with his signature, this being our authoriza-

Announcing The New

MONROE

REG. TRADE MARK

Automatic



Marks a New Era in Mechanical Calculating and Adding

THE Monroe Automatic, a masterpiece of mechanical ingenuity, opens up still greater possibilities in Speed, Accuracy and Ease in handling figures.

Quiet, smooth-running, with split-second speed, this latest addition to the Monroe line of figuring machines retains all the Sturdiness of construction, Visibility of operation, Flexibility, and wide Usefulness of the standard Monroe.

Addition, Subtraction, Multiplication, Division, or their several combinations, may be done with a few light touches of the fingers and with almost unbelievable speed.

Here at last is a portable Automatic machine, electrically driven, you can have on your desk, at your elbow, in instant readiness at all times. Beautiful in appearance, compact in construction; so simple to handle that *anyone* can operate it.

To Add or Multiply, simply touch the Plus (+) Bar. To Subtract or Divide, touch the Minus (-) Bar. The Proven Answers automatically appear —the *machine does the work*, relieving the operator of worry and effort. No troublesome change levers. An ingenious mechanical control protects the machine against locking or abusive operation.

Words fail to describe adequately the wonders of the Monroe Automatic. Ask to see it in action to appreciate its Speed, Simplicity and Economy in the handling of figures. The coupon below is for your convenience.

COUPON

Monroe Calculating Machine Company,
Woolworth Building, New York City C-1-23

Without cost or obligation (check item desired):
[ ] Send descriptive literature of the Monroe Automatic
[ ] Arrange for free demonstration on our work

Firm Name _____

Individual's Name _____

Address _____

MONROE

REG. TRADE MARK

Calculating Machine Company

General Offices: WOOLWORTH BLDG., N. Y.
Plant: ORANGE, N. J.

There are Offices rendering Monroe Service at all Principal Points in the U. S. and Canada and throughout the World

Style	C-62	Looms Per Weaver	20	Hours Per Week	55
Pick and Sley	60 x 172	Loom Speed	160	Base Rate	24.00
Warp & Filling	18 & 20	Est. Production	90%		
Reed Width	36¼"	Yards Per Pound	1.75		
Yards Ped Cut	80				

$$\frac{160 \times 60 \times 55 \times 20 \times .90}{172 \times 36 \times 80} = 19.18 \text{ Cuts Per Week.}$$

24.00 ÷ 19.18 = $1.25 Price Per Cut.

Style	V-4	Looms Per Weaver	25	Hours Per Week	55
Pick and Sley	66 x 300	Loom Speed	160	Base Rate	$26.50
Warp & Filling	30 & 40	Est. Production	85%		
Reed Width	36½"	Yards Per Pound	2.65		
Yards Per Cut	155				

$$\frac{160 \times 60 \times 55 \times 25 \times .85}{300 \times 36 \times 155} = 6.70 \text{ Cuts per week.}$$

26.50 ÷ 6.70 = $3.955 Price Per Cut.

Style	M-18	Looms Per Weaver	14	Hours Per Week	55
Pick and Sley	66 x 112	Loom Speed	160	Base Rate	$25.50
Warp and Filling	12 & 13.25	Est. Production	85%		
Reed Width	36¼"	Yards Per Pound	1.85		
Yards Per Cut	80				

$$\frac{160 \times 60 \times 55 \times 14 \times .85}{112 \times 36 \times 80} = 19.34 \text{ Cuts Per Week.}$$

25.50 ÷ 19.34 = $1.32 Price Per Cut.

Style	S-8	Looms Per Weaver	20	Hours Per Week	55
Pick and Sley	72 x 124	Loom Speed	165	Base Rate	$23.60
Warp and Filling	40 & 36	Est. Production	90%		
Reed Width	42½"	Yards Per Pound	3.75		
Yards Per Cut	60				

$$\frac{165 \times 60 \times 55 \times 20 \times .90}{124 \times 36 \times 60} = 34.98 \text{ Cuts Per Week}$$

$23.50 ÷ 34.98 = $0.671 Price Per Cut.

tion to place on the pay roll as the price to be paid per cut on that style.

Next in order comes the piece work section of the pay roll, which is composed of weavers only.

First, however, before proceeding with the piece work pay roll, it will be well to say a few words in regard to the request blank for new weaving prices. The base rate of course will vary for the different kinds of work, the reason being that some kinds of work require greater skill on the weaver's part than others; then again, the locality in which this work was being done would have some effect on this. However, the main point is that it is very necessary that an established base rate shall be in force, so that a recognized system may be followed, economic conditions, working agreements, etc., governing this. We shall now proceed to establish weaving prices for the various styles of cloth, first, however, giving the various style numbers, letters, etc.. by which they shall be known and so identified; thus V-4 will be velveteen, C-62 corduroy, M-18 moleskin and S-8 sateen, then figuring, according to recognized method, the weaving price per cut.

First the organization will be shown for each style as follows, the weaving price then being figured as previously shown.

Space will not here permit of figuring the cost per pound, but this fact may be kept in mind, that the cost of non-productive hands must always be way below that of the productive hands, this being the secret of a low cost per pound.

In a later article on this matter I will take up the figuring of the cost per pound from the data here obtained.

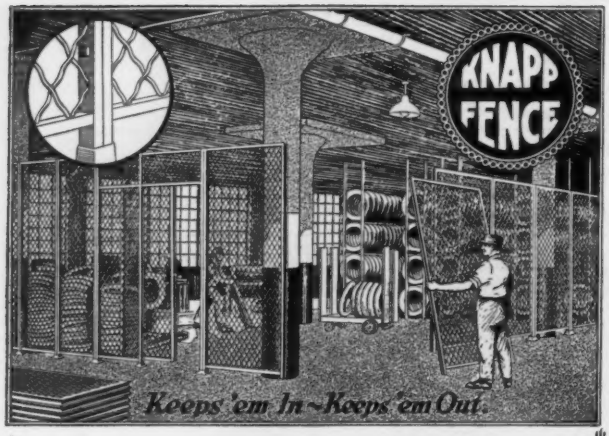
Benjamin (Conn.)

A Device to Even the Card Sliver..

EDITOR COTTON:

I wonder how many readers of this department have had the opportunity to pass judgment on the new device which is supposed to hold the card sliver at standard weight immediately after stripping. I am told that the inventor is a carder, and I for one am willing to admit that he is in line with efficiency; that this device will be a success there is not the slightest doubt, but in fine goods mills only.

The device works as follows: After the card is stopped for stripping, when the door is pulled down, a connection shifts the doffer bevel gear on the feed shaft from the bevel gear on the doffer to a larger bevel which increases the feed to the maximum amount of 22 per cent. When the



Erected Quickly Anywhere

For either permanent or temporary use, anywhere about a factory, warehouse, or wherever a partition is required.
Strong and rigid—yet easily moved when necessary. Keeps out meddlers, yet lets in light and air. Prevents loitering. Stock visible at all times yet amply protected.
You can save time and money by using

KNAPP STANDARD WIRE PARTITIONS

Made in standard units, including gravity doors, swing doors or wickets.

Some of the Many Uses

Tool cribs, factory subdivisions, stock rooms, department offices, shop restaurants, wash rooms, locker rooms, passage ways, etc.

Let Us Save You Money On
Window Guards, Factory Guards
Skylight Guards, Factory Gates, etc.

Send Sketch or Dimensions for Prices.

THE KNAPP FENCE CO.
E. 134th St. Cleveland, O.

Attractive Opportunity for Live Sales Agents
Write for Particulars

Faster, Better Cleaning and Longer Life for Roving Bobbins

The Termaco Roving Bobbin Cleaning Machine cleans bobbins faster than hand cleaning—36,000 bobbins a day are an average day's work for the Termaco.

The Termaco cleans roving bobbins more thoroughly than hand cleaning and without injuring the bobbins. Waste is entirely removed from the bobbins by the cleaning action of the Termaco, which cards off the waste instead of cutting it off.

No splintered bobbins result from Termaco cleaning. Bobbins cleaned by the Termaco Machine have a much longer life than bobbins cleaned by hand. Even bobbins splintered by hand cleaning, when afterwards cleaned by the Termaco, eventually have splinters rubbed off and again become smooth.

The Termaco is easy to operate. There are no exposed gears or other parts of the machine to catch the operator's clothing, or which might possibly cause damage.

All parts of the Termaco are interchangeable, and it requires no skilled mechanic to keep the Termaco in first-class operating condition. The Termaco will give years of continuously satisfactory service.

Have our Engineering Department send you complete details as to the saving in cost of bobbin cleaning the Termaco will effect in your own mill.

TERMACO

Every machine trade-marked "TERMACO" is sold under a binding guarantee as to workmanship, material and operation.

THE TERRELL MACHINE CO.
(INCORPORATED)

Engineering Department **Charlotte, N. C.**

General Supply Co., Danielson, Conn., Representative for N. Y. & N. E.

door is closed after stripping, the device can be adjusted to take up as many teeth as desired. The whole thing is worked on the idea of a ratchet and multiplier. The more teeth the heavier the feed.

However, is it not strange how mill men will fall for the incoming new idea, and fail to notice a better remedy in the columns of COTTON? I have repeatedly pointed out in these columns that the stretch of the sliver on the drawing frames and slubbers amounted to much more than the variation caused by the stripping of the cards. Let the reader make the test for himself, and weigh his sliver from full cans at the back on the drawing and slubbers, and when the same cans are nearly empty, size again. He will be amazed at the difference.

Now, how many mills have spring bottoms for their cans? The advantage was pointed out in these columns not so long ago. I find spring bottoms in most thread mills, but many mills that are almost in agony to keep even numbers struggle along without them, and instead will install something like the device mentioned. As stated, this new device is okeh, but not as beneficial as spring bottoms. I know, for I have made the test. Wash (R. I.)

Carding and Spinning Questionnaire.

Officers of Textile Operating Executives of Georgia have mailed to every cotton mill superintendent in Georgia a copy of a questionnaire on carding and spinning. This is the organization formed by the Georgia mill superintendents and department heads in September for the discussion of mill subjects, and this carding-spinning questionnaire is the product of the committee appointed for that work, consisting of J. W. Hames, chairman; G. R. Brook and C. M. Young.

The superintendents receiving this questionnaire are to reply to each question separately, giving their opinions on the different subjects as they are related to their own product and conditions. The questions and the answers received will form the basis of the practical discussion at the organization's meeting in the early part of 1923.

Inasmuch as the questionnaire contains a large number of questions of importance and interest in connection with the departments that it covers, it is reproduced herewith, and if any readers in other sections desire to comment on or discuss any of the questions here appearing, the columns of this department are open for the publication of their remarks. In conformity with the custom of this department, no names, either of men or mills, will be published or divulged in connection with such letters.—The Editor.

OPENING.

1. Please give the following information concerning your plant: Length and grade of cotton used; number of spindles; number of looms. What is the finished product of your mill?

2. On your class of work, what method of opening have you adopted as the best?

3. Do you use the vertical or Crighton opener?

4. Do you use the vertical or Crighton opener in double or triple tandem?

5. If so, do you get better results with grid bars or the perforated screen? Why did you adopt the type used?

6. What is the difference in waste extracted with the grid bars wide open and one-half open?

7. What percentage of waste, through the cards, was taken out in the vertical opener?

8. What is the difference in the weight of waste taken out on the first and second vertical openers?

9. In the tandem use of the vertical opener, what speed of beaters are best on your type of work? Why? What speed is best when used singly?

10. What method have you for mixing roving and scavenger waste back into the regular stock?

11. Is it advisable to use humidifiers in the opener room? Why?

12. Users of Crighton or vertical openers claim the waste percentage through the cards is no greater than when not using them, but that the yarn is stronger and cleaner. How can this be so if more leaf and dirt are removed to make the yarn cleaner?

PICKERS.

1. How many processes of picking do you use? What are the relative merits of two and three processes of picking on your class of work?

2. What kind of beaters do you use in each picker, and why?

3. How many beats per inch do you give? In the breaker? Intermediate? Finisher? Give reasons for adoption of these.

4. If you have installed the vertical opener, did you find it necessary to make any changes in your pickers, either in settings or speeds or in the number of processes? If so, what changes were necessary, and to what do you attribute the necessity for these changes?

5. What settings on the blade beaters and Kirschner beater do you find best for obtaining breaking strength? For obtaining cleanliness? Why?

6. Have you tried ball bearings on the aprons? If so, what improvements did you get?

7. Are the evener motions on your pickers so adjusted as to make the necessary compensation with only three laps on the apron as would be the case with four laps on? If you have not made this experiment, please do so, and report any improvement you may find in the running of the work by this adjustment.

8. Should picker machines' exhaust fans be piped to the dust chamber in separate pipes or is it permissable to connect more than one or two machines on the same pipe?

9. What is the cause and prevention of split laps?

10. What percentage of variation should be allowed in the weights of finisher laps?

11. Should intermediate laps be weighed and a limit as to variation placed on them the same as on the finisher laps?

12. Should humidifiers be used in the picker room?

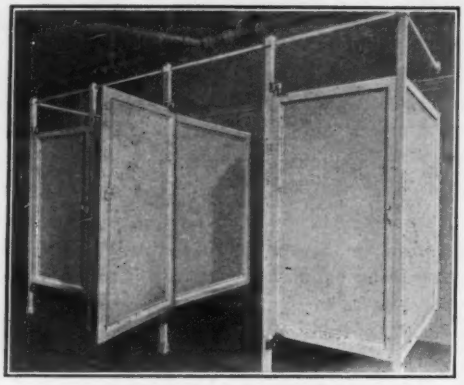
CARDS.

1. Do you prefer a heavy lap with slow feed or a light lap with faster speed? Give reasons.

2. If you were going to reduce your carding would you do it by reducing the speed of the doffer, the weight of the sliver, or the weight of the lap? Why?

3. Which is better, light or heavy grinding?

4. What is your experience with different settings, especially with reference to the breaking strength of yarn and cleanliness? What settings do you find best on the licker-in to cylinder; and feed plate to licker-in?



For the Scranton Lace Co., Scranton, Pa.

How Strong and How Well Put Up?

No. 1 of a series on "How to Judge Metal Partitions"

A VITAL point to the purchaser of metal toilet partitions, is a knowledge of just how rigidly these partitions are built and erected. The U-Channel illustrated below is a special Sanymetal feature, allowing for adjustment of the partitions to any unevenness in the wall, and insuring a tight and accurate fit. The partitions are securely bolted, through this channel, to the wall. The solid anchoring of post to floor, and head-rail brace to wall, mean a substantial, unshakable installation. The faultless metal craftsmanship on every Sanymetal partition, the perfect mitres, thorough electric welding, and absence of cracks and crevices, together with the uniform heavy gauge metal used, are additional reasons for the strength and ruggedness of all Sanymetal work.

Other quality features are: Sanymetal Gravity Roller Hinges, sanitary water-shedding base shoe, slant-lip partition mold, improved door design with new molded stile, exclusive use of Armco Iron, electro-zinc rust-proofing of all hardware, fine baked enamel finish, unit sections adaptable to any arrangement.

Ask for new Toilet Catalog No. 5, just off the press. Catalog No. 4 describes Sanymetal Office and Mill partitions.

Sanymetal U-Channel

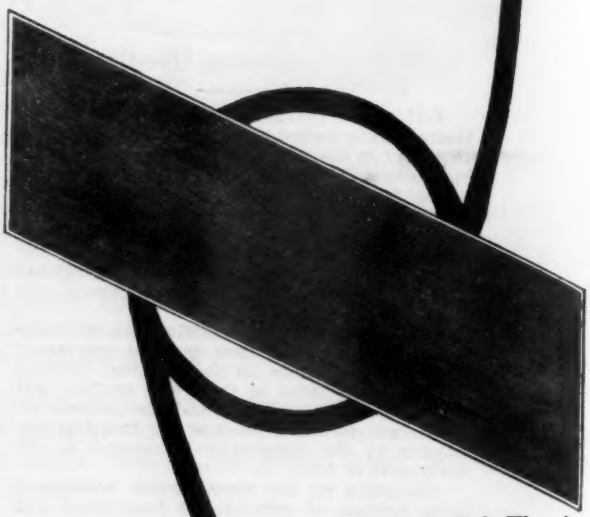
THE SANYMETAL PRODUCTS CO.
986 E. 64th Street Cleveland, Ohio

Sanymetal
TRADE MARK U.S. REG.
Toilet and Office Partitions

Creo-pine Sub-Flooring

Outlasts the factory but costs no more than any first-class untreated, sub-flooring.

Affords uninterrupted production, eliminates floor repair costs, assures durability and top floor stability.



Creo-pine Sub-Flooring —is vacuum pressure impregnated with pure coal tar creosote oil.

Impervious to all deteriorating influences of rot.

"Timber Penetrated by Creosote Oil Will Never Rot."
Bulletin No. 14, U. S. Dept. of Agriculture.

Southern Wood Preserving Co.

Atlanta, Ga.
Station A

Manufacturers of Creo-Pine
Block Floors for Heavy Traffic Duty
Shingles that Never Rot
Fence Posts Assured Life 25 to 40 Years.

5. What draft do you find best?

6. What result is obtained by reversing the direction of the card flats?

7. What is your opinion of compressed air for the card room?

8. What is the best speed for the licker-in?

9. Does it injure the staple to set the feed plate to a No. 7 gauge on 1-inch staple?

DRAWING.

1. How many doublings do you use on drawing?

2. Which do you find best for your work—one, two or three processes of drawing? Why?

3. At what speed do you run the front roll on drawing? What speed do you consider best for the front roll?

4. What draft do you consider the best on drawing frames?

FLY FRAMES.

1. What drafts would you use on slubbers, intermediates and fly frames for best results, and what benefit would these be to your spinning?

2. Where is the best place in the card room to make a change in order to maintain even numbers?

3. Have you tried exchanging the front steel rolls from right-hand frames to left-hand frames, and vice versa in preference to having the rolls re-fluted? If so, what are the benefits?

SPINNING.

1. What draft do you find best? On single roving? On double roving?

2. Will standard twist in warp give a better breaking strength than one tooth over standard or one tooth under standard?

3. Which is best from the weaving standpoint and from the spinning standpoint—running the traverse on filling up slow or down slow?

4. What is the difference in evenness and breaking strength with single roving or double roving?

5. Which do you prefer for your work, No. 1 flange ring or No. 2 flange ring? Why?

6. Which do you prefer, tape drive or round band drive, and why? Is it possible to run with less twist with the tape drive?

7. Have you tried using wax or other dressing on the spinning bands or tapes?

8. Does it pay to have the spindles plumbed and the frames leveled and lined once a year, or does it do just as well to do this one year and set the spindles at the top the next year? In other words, do the results justify the expense of overhauling spinning thoroughly every year?

9. When "plumbing" spindles do you level the ring rails cross-ways as well as length-ways? How do you do this?

10. What is the best distances to set guide wires from the top of the spindles?

11. What size band do you use to drive your spindles; that is, how many bands to the pound? Is it made of roving or yarn? How many turns per inch in the roving and what size roving? What is the size of your whirls?

12. Do you oil lifting rods? If so, what kind of oil do you use—animal or mineral?

13. Is it better to change travelers and oil spindles on a certain number of frames a day or have a special day set aside for doing this work?

14. What increase in production can be obtained by using filling wind on warp? What is the difference in breaking strength obtained?

15. Should yarn be sized and tested for break under same condition of humidity as it was spun? Give results of any tests you have made in this connection.

16. What causes one end of a shell roll to become fluted?

17. Which is the better method to run warper drums—forward or backward? Give your reasons.

The Duties of the Efficiency Man.

EDITOR COTTON:

The longer we live, the more convinced we become that there are two sides to every question, for everyone sees things under a different aspect, and seeks a different plan of finding his way through the world. Hence, there is wisdom in a multitude of councilors. Mill managers and superintendents are in reality industrial engineers or textile engineers and so I shall write of the duties of such an engineer as they appear to me, trusting that my reflections may set in the right direction the drifting thoughts of any uncertain minds now engaged in cotton manufacturing.

What faculties equip a man as an industrial engineer? Knowledge, skill and experience. Knowledge and skill may be secured in some degree by practice in the handling of tools, and by the number of times the operation or work has been performed, but the broader knowledge which leads to success, and that more perfect skill which wins distinction, can be acquired only through diligent study.

The man who would rise in his calling must learn all about the nature of the materials with which he works, he must know what are the best tools to use and why, he must understand the philosophy of the forces with which he deals, and he must seek to comprehend the natural laws which govern or regulate the operations connected with his particular handicraft.

The duties of such a man embrace a very wide range of subjects, and the different departments into which the profession is divided do not admit of very strict definition.

In order to understand the efficiency of the worker, the engineer should know that the mechanical daily duty of a man is the product of three quantities: the effort, the velocity, and the number of units of time per day during which the work is continued. It is well known that for each individual man there is a certain set of values of those three quantities which make their product the daily duty, a maximum, and that any departure from those values diminishes the daily duty. Attempts have been made to represent by a formula the law of this diminution, but they have so far met with imperfect success.

Motion study is a subject of much general interest to such a man. He must make a careful investigation of conditions governing the number of motions made by the workers, and the methods of reducing this number. It has been definitely proven that efficiency engineers in different trades, industries and professions, have increased the output and at the same time decreased the cost of production. They have eliminated labor troubles by raising wages, which was possible owing to the improvement in the quality and quantity of the work. Therefore, one of the duties of the scientific mill manager consists in reducing the number of false motions made by the workers. In other

The Sign of Protection

DIXON'S
Silica-Graphite Paint

has been on the market for over 50 years and is made in FIRST QUALITY only. The pigment is Nature's own mixture of flake graphite and silica while the vehicle is the best boiled linseed oil obtainable.

Dixon's Silica-Graphite Paint is immune from attacks by acids, alkalies, gases and fumes. Impervious to water and not affected by heat or cold.

It dries into a smooth elastic surface and lasts for surprisingly long periods of time, records running from 5 to 15 years on various metal and wood surfaces.

It is the only paint in which graphite and silica are naturally and not artificially combined, and this feature is essential to long life, efficient surface protection, elasticity and resistance to dampness.

Write for Booklet No. 34-B and see how it will lower your paint costs.

Joseph Dixon Crucible Company
Jersey City, N. J.
Established 1827

Warren Soaps

Preferred Stock

The best quality tallow, palm, and red oils and olive foots, carefully balanced with the purest chemicals for your special purpose.

Uniformity guaranteed by test before shipment.

Warren Soap *Warren Service*

Warren Soap Mfg. Co.
Established 1870
77 Summer St. Boston, Mass.
Incorporated 1890

GARLAND

GARLAND Harnesses ARE BEST FOR MACHINE Drawing

Our harnesses are especially well adapted for machine drawing because of the alignment of the eyes and their shape. The eyes always stand square throughout the length of the harness and they are of just the right length and opened just enough to produce the best possible results in machine drawing. Our harnesses are as near perfect for machine drawing as it is possible for a harness to be made.

TRADE MARK

GARLAND MFG. CO.
SACO, MAINE

COTTON MILLS SHOULD USE Commercial Acetylene For Welding

Supplied in portable cylinders on loan basis without deposit.

Only the purest gas can safely be trusted to meet the exacting demands for cotton mill welding repairs. Commercial Acetylene is a gas of absolute purity.

WRITE FOR OUR SERVICE AGREEMENT

Commercial Acetylene Supply Co.
204 Trust Company of Georgia Bldg., Atlanta, Ga.
Main Office: 80 Broadway, New York City
203 S. LaSalle St., Chicago

Aurora, Ill. — East Deerfield, Mass. — Boston, Mass. — Toronto, Ont. — Moberly, Mo. — Bound Brook, N. J. — San Francisco, Cal. — Berkeley, Cal.

words, if a workman makes four motions when two would suffice, the labor cost is double what it should be. So a careful study of the workers' movements should be made by a suitable person and all workers who make false movements be properly instructed.

The duties of the textile engineer, as I see them, are not only to make a careful investigation of the number of motions made by the workers, and the methods of reducing this number, but he must also make scientific investigation of mechanical conditions, such as the proper drafts and the proper twist in the different kinds of cotton to eliminate gear changing, to detect any machinery out of alignment, etc. Included in his work should be the layout of the machines along more efficient lines so as to balance the processes and at the same time increase the output of a better quality of product.

How often is such a man found in the cotton manufacturing industry? In almost every cotton mill, as a rule, we find a very good carder or spinner. His ability is measured generally by being able to find the proper drafts and to insert the proper twist in the roving or yarn and also to properly manage the help. But where can we find an overseer who can instruct the help in making the proper motions when piecing, creeling, and doffing, or who can explain just how to put the shuttle in the loom, etc.? We can find carders enjoying the best of reputations who never creeled a bobbin of roving in all their mill experience. And there are many overseers of ring spinning who never doffed in all their mill experience. On the other hand, there are many carders who can creel as good as any tender, but who know little about the art of drafting—which I will explain later. There are many good carders who can creel fairly well, good enough to instruct green hands, and who understand the art of drafting, yet who know very little about the nature of the stock and its peculiarities. It is safe to say that there are few men at the present time who could efficiently fill the position of textile engineer in a mill.

The structure of the cotton fiber, its hollow spiral or collapsed tubular form, with its delicate waxy walls and its wonderful adaptitude for drafting and twisting and manipulating under proper atmospheric conditions, should be well known to the man in charge for three reasons:

(1) He could instruct the carder on how to change the weights of the laps in order to eliminate gear changing throughout the mill. For instance, when the cotton is of a wiry nature, the laps should be made to weigh one-half a pound lighter than standard, and when fluffy, the lap should be made to weigh one-half a pound heavier than standard. This point seems to be little understood by many carders, and it is one that counts much in eliminating gear changing. As a rule, when a carder boasts how close to standard his laps are kept, he never stops to consider that wiry cotton has a double gain, namely in weight and contraction, while with fluffy cotton conditions are just the opposite.

(2) Knowing that the cotton fiber and its working is affected by atmospheric conditions, he should refuse to undertake to operate a plant not using humidifiers, for the simple reason that his reputation is at stake on this point.

(3) He should reject the idea of setting the flats down to 3/1000 as seems to be the practice in some of our finest mills, for the reason that such a close setting robs the fibers of their waxy walls which make the stock fluffy and consequently produces weak yarn.

The chief aim of the textile engineer or superintendent, call him what you will, should be to keep the stock as coherent as possible, and in order to attain that object the beaters must first receive his attention. He should know that the stock should not be struck more than 40 blows to the inch. In some mills the stock is struck 60 blows to the inch, in some cases more, which accounts for the continual fluffy work in such mills. It would be his duty to see that the laps on the lattice aprons in the picker room were of different sizes so as not to run out together. It has been proven in practice that by properly arranging the laps fed in the different pickers so as to run out at a different time, the operative could attend double the number of machines.

The amount of strippings a card should make is another important question. And let me say here that there are few carders who understand how to manipulate the front knife plate so as to extract only the undesirable matter. Let us be honest with ourselves now, and let us all admit that the front knife plates in most mills are never disturbed, no matter what kind of stock is run. What a waste of money! An examination of the strippings from the cards in some mills would show the majority of fibers to be as long as the fibers of the stock in use.

The doffer combs on the cards should be all positioned alike, but in most mills it will be found there are so many high and so many low, which causes the web to follow the doffer at times in the first case and to sag in the latter. It would be the duty of the carder to see that they were raised slightly in the summer months to eliminate the sagging of the web, and to see that they are lowered in the winter months to prevent the web from following the doffer.

On the drawing frames, see that the end of the strand is properly placed when a piecing is made. Almost every drawing tender will throw the end of the strand over the others, instead of lifting the portion of the strand running out and placing the end of the strand from the new can under it. A great deal of bad work is made on the drawing by not making a proper piecing. When the strand is carelessly thrown up to the drawing rolls as described, the end of the new strand will not lie in close contact with those under it, and when it comes under the action of the drawing back top roll, it is made to curl slightly in almost every case. This, of course, will cause a small lump which will in turn cause the front roll to jump slightly, and if the web is not broken, it will cause the end to break at the slubber; if not, it will cause a slub in the yarn, and a bad one too. On the other hand, if the end of the new strand is laid under the end of the strand running out, the piecing made is so perfect that the part of the strand where the piecing was made cannot be detected.

In many mills it has been discovered that having the trumpets too large has been the cause of much bad work, such as large portions of clearer waste and lumps coming from the drawing. To overcome this trouble, have the trumpets bored and insert small brass trumpets with a hole only 3/16 of an inch in diameter. For a fine goods mill running a light sliver, even 3/16 of an inch is too large. Still it is often found that some of the trumpets are worn to ¼ of an inch in diameter.

A practical man will see that a very short draft exists

BLEACHERS!

"Better fabrics" is the cry.
You want to start by giving them
a Better Bleach.

The goods should be given a
permanent white without weakening,
of greatest elasticity and
softness.

Only Peroxide bleaching can do
all this, without increase in cost.

Ask us how.

THE ROESSLER & HASSLACHER CHEMICAL CO.
NEW YORK

between the first and second rolls on the slubber. He must also see that a perfect piecing is made by the tender. More hard ends are made at the slubber by improper piecing than anywhere else. Slubber roving as a rule is bulky, and if both ends of the strands are not tapered when a piecing is made, a hard end is sure to result at the intermediates. A great many carders seem to think that the cause is that the tender wets his fingers, but such is not the case. I have proven to my own satisfaction that when a piecing is properly made, even if it is made by wetting the fingers, no harm will result, as I find that the moisture is absorbed by the time it reaches the next process. A hard end results from offering too great a resistance to the drawing action of the front roll, and this is done by the strand being too bulky, by the stock being too wiry, or by the staple being too long for the distance at which the rolls are set.

Slubber tenders, as a rule, twist the strand too much when making a piecing. When piecing on the slubber, the strand should be twisted only slightly, for the reason that it is bulky enough to be drawn down the slot in the hollow leg of the flyer without breaking. The idea of twisting the slubber roving hard when piecing originates from the fine frames, where it is of course necessary in most cases to twist the strand a couple of times. So it would be the duty of the textile engineer to know how the strand should be twisted when piecing at the slubber, and to instruct every tender accordingly.

There are more false motions made in creeling than anywhere else in a cotton mill. To prove what is said, watch the different tenders in any mill and it will be discovered that they all have a style of their own. Not only are the motions different but, the manner they adopt in arranging the roving in the creels differs also. For instance, it is seldom that there will be found no ends crossed in the creel of any frame. To some this would not appear to be an evil, but to the experienced man it would be regarded as a chief failure in the making of a good tender. When creeling the front row or the back top row, it is necessary to leave a certain amount of slack roving. This is done so the piecing will enter the drawing rolls before the strain comes on the strand to turn the bobbin. This slack portion of roving will drop and if there are any crossed ends under it, these crossed ends will carry this slack portion of roving to another delivery and draw it in the drawing rolls, thus making double roving in one place and single roving in another.

This trouble seems to bother more on the intermediates, because of the fact that the strand is heavier and that more creeling is done. However, if the reader is in charge of a cotton mill, let him examine the creels of all the speeders in his mill and he will be surprised at the number of crossed ends he will doubtless find. The best way to arrange the roving in the creel is to have one end of the front row running with one end of the middle back row, and one end of the back top row running with one end of the bottom back row. When creeling the top back row, a certain amount of roving is left hanging so that the tender can have time to change the empty bobbin to a full one. I have found that not watching this hanging end is the chief failure of most speeder tenders not being good creelers. This end comes in contact with the revolving roving in the creel, and if not held by the left hand while the right hand is making the change from the empty to the full bobbin, it is taken around one or more bobbins, thus not

only breaking the hanging end but also the ends around which it is wound. It is the simplest thing in the world to hold the hanging end from the creel while changing bobbins, still it is surprising how many tenders fail to do it, and this is often the cause of getting into a mess.

I believe every mill man will agree with me when I say that more skill is required to operate a pair of speeders than is necessary on any other machine in a cotton mill. Watch a green hand making the first piecing and he will appear very clumsy. What makes a green hand clumsy? What makes a male speeder tender clumsy? How many overseers of carding could answer these questions correctly? In many mills all green hands appear clumsy for weeks, when all this awkardness should, with proper instruction, disappear in a single day. Very few, if any, overseers seem to give this important question of motion study any consideration. Ask any overseer what makes a green hand clumsy so long a time, and in almost every case he will answer that it is due to lack of practice. But what does practice amount to, if the green hand begins with false motions? The real cause is lack of instruction. Most every green hand or male speeder tender, when piecing, will take hold of the end of the strand with the left hand, which is correct, and hold the strand with the thumb and forefinger of the right hand to insert the strand in the slot of the hollow leg of the flyer, which is incorrect. That will make a tender clumsy, because he must partly close the hand when holding the strand with the thumb and forefinger, and as there is little space on fine frames or jacks, a person appears more clumsy here than when piecing on the slubber or intermediate. In this one instance, the efficiency engineer would save any plant many dollars. When piecing on any speeder the end of the strand should be held by the left hand, then from a distance of about four inches longer than the hollow leg of the flyer from the left hand, the strand should be held by the forefinger and second finger of the right hand, and the tender should then proceed as follows: Hold the strand between the fingers so it will be under the forefinger and over the nail of the second finger; place the strand in the slot of the hollow leg of the flyer, and move the fingers down the hollow leg of the flyer as if wiping it. If the reader will try this plan and put it into practice, he will find that a green hand can learn to piece an end in a single day with ease. This can be proven by a superintendent or even a treasurer who never pieced an end before in his life. When the strand is held in this manner, the hand is kept open, and no matter how narrow the gauge of the frame may be, there is always plenty of room. When the stroke down the leg of the flyer is completed, the strand should still be held in the same way when the number of turns necessary is made around the horizontal presser.

At doffing time the ends must be "run over," as it is termed. How many carders know the amount or length necessary to wind the end on the empty bobbin? This is a question I have never seen discussed in print, and a practical mill man will admit that very little consideration has been given to it. But will not the right amount save the tender and doffers from making an unnecessary number of turns when winding the strand on the bobbin, and will this not cut the doffing time? When the doffing time is cut the production is increased, and a larger production reduces the cost per pound.

In most every machine builder's catalog, fifteen minutes is allowed for doffing. I have seen three doffers and a tender doff a frame of 192 spindles in eight minutes. But everything was ready. The empty box and bobbins at the end of the frame, and the right amount of roving run over. Did the reader ever notice a speeder tender examine the cone belt after doffing to see if the piecing was giving out? Of course not! Why? Because she was never instructed to do so by the overseer or second hand. On all bobbin-lead frames, the greatest strain on the cone belt is after doffing. The reason for this is that the cone must be driven at its maximum speed when the belt is on the small end of the bottom cone. No doubt many readers of COTTON have seen a cone belt break before the completion of the traverse was made after doffing. There is nothing worse than a cone belt breaking in any mill, but more so in a fine goods mill, because many piecings are dirty and show up in the finished cloth. When all the ends are pieced on a speeder, a great amount of hard ends and breaking back takes place at the next process, still all this can be almost entirely eliminated by instructing the tender to examine the cone belt at every doff. These are things to be taken care of for the sake of efficiency.

There is not one practical man but who will admit that the foregoing is all true, still cone belt breaking goes on, simply because no one seems to think of such small but important duties. How many carders use a little belt dressing on their cone belts? On all bobbin-lead frames, the cone belt drives the bobbins, and if a little belt dressing is added every morning to the cone belt, it will be found to improve the running of the work.

The success of a cotton mill depends upon the attention paid to the proper drafting of the machines. A draft may be expressed in several ways. Draft is the surface speed of the front roll, or the delivering roll, divided by the surface speed of the back roll, or the number of inches fed. Draft is equal to the hank coming out divided by the hank going in. Draft is equal to the weight per yard going in divided by the weight per yard coming out. If we have .60 hank roving running (2 into 1) at the intermediate, making 1.75 hank intermediate roving, the following should prove itself, if no retardation of the front top roll takes place: $.60 \div 2 = .30$. $1.75 \div .30 = 5.83$ draft. But this rule is seldom used in most cotton mills, because the retardation is so great on the front roll that such a rule is made worthless.

There is a great deal of difference between draft calculations and the art of drafting. It is common to see articles in textile papers and in text books treating on draft calculations, but we never see any discussion on the art of drafting. An efficiency engineer may be an expert in calculating and manipulating drafts, but if he has no knowledge of the art of drafting, all his knowledge in most cases is worthless, and in some cases injurious.

What is the art of drafting? It is undertsanding the nature of the stock, the amount of twist in the strand fed, the types of saddles and top rolls used. These are some of the things that should be considered, and they are the things that would bother a man more than the calculations. Some overseers seem to think that when they know how to calculate the draft of a frame that that is all there is to it. But to the man that understands the art of drafting, the calculation is only an approximation.

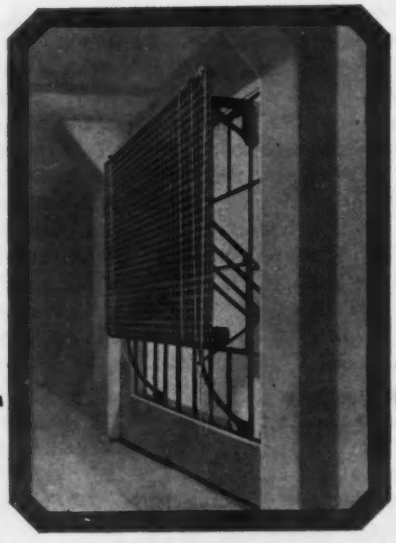
The contraction of twist in the slubber roving amounts

DIRECT COTTON COLORS

CENTRAL DYESTUFF & CHEMICAL CO.

MAIN OFFICE AND WORKS: NEWARK, N. J.

ESTABLISHED 1898



RA-TOX

Wood Fabric

VENTILATING WINDOW SHADES

Cost no more than ordinary shades and last longer. Easily equipped to any sash. 30% to 40% more air and light without heat and glare of sun. Write

HOUGH SHADE CORPORATION

Industrial Shade Division

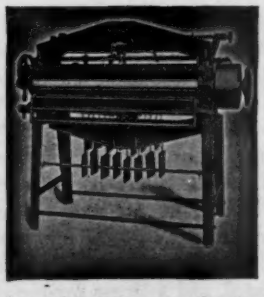
300 Mills Street Janesville, Wis.

"ATLANTA" HARNESS

"Quality and Service That Satisfies"

ATLANTA HARNESS & REED MFG. CO.

ATLANTA, GA.
P. O. Box 1375
Telephone Main 517



50% Better than ever from YOUR Standpoint

SEVERAL NEW FEATURES

have been added to the "1913" Cloth Cutting, Folding and Winding Machine which add at least 50 per cent to its value to YOU.

It will cut your cloth—fold the edges—roll it up and give you an exact measurement of every piece of cloth going through the machine.

It saves time, labor, machines and cloth.

YOU ONLY NEED ONE MACHINE where before it required two, and you get an extra strip from each bolt of cloth.

It cuts the corners of expenses in every way and leads to more and greater profits.

THE ENORMOUS SAVING WILL INTEREST YOU.

Mail a card for complete information and prices.

When in need of special machinery, write us.

J. A. FIRSCHING, 614 Broad St., Utica, N. Y., U. S. A., Dept. "C."

to very little, still when the surface speed of the front top roll is divided by the surface speed of the back roll, the result obtained varies to a great extent from the calculated draft. In almost every case it will be found that having a long draft with wiry cotton is more injurious than with fluffy cotton. Wiry cotton will of course stand a much more severe treatment than fluffy cotton, but it is the retardation it causes to the front roll that makes the yarn full of light places. If the reader is a carder or a superintendent of a cotton mill, let him make the following test: Prick punch the end of one of the back top rolls and one of the front top rolls, count the number of revolutions made by each and then divide the surface speed of the back roll into the surface speed of the front roll. It is surprising in most cases the difference found from that of the figured draft.

It will be found that in most mills where conditions are bad, the cause is in not having enough intermediate spindles. This is done, of course, to reduce the cost, but it has been proven that the least number of intermediate spindles increases the cost. The same can be said about slubber spindles. An experienced man would insist on having the proper number of spindles for each process, and not depend on a long or short draft to balance such process. He would point out to the man at the helm that the weaving production of a better quality is possible by having the surface speed of the back roll and front roll equal or nearly equal to that of the figured draft.

To prove what the art of drafting amounts to in a cotton mill, I give the following, which is a change that was made by me when in charge of a card room in a Massachusetts mill: Number of fine spindles, 5,784; number of intermediate spindles, 1,140; production, 37,000 pounds per week; cost per pound, .01. A pair of intermediates were installed which increased the intermediate spindles to 1,254. The draft on all fly frames was made shorter which increased the production to 44,000 pounds per week. Before the change the pay roll was $390 ÷ 37,000 = .01. After the change the payroll was $420 ÷ 44,000 = .0095 cost per pound.

The textile engineer should be able to detect flyers that are out of balance. When flyers are out of balance a certain portion of the carriage will shake. The chief cause can be traced to what I term "home flyer fixing." There are very few men employed in a cotton mill that can properly repair and balance a flyer. In my mill experience, when taking charge of a card room, I have in every case found a part of the flyers in poor condition. For instance, the end of the horizontal pad only should rest on the surface of the bobbin, but an examination of a fly frame at doffing time will show the whole portion of the eye of the pad resting on the surface of the bobbin, a condition that should never exist. It requires a great amount of skill to properly repair a flyer so that the presser rod will be free to respond to the speed of the frame, and at the same time be properly balanced. Some mills buy the presser rods by the dozen and have Tom, Dick and Harry attach them to the hollow leg of the flyer, but if mill men knew the amount of bad work and loss of production that such a practice causes, they would send all injured flyers to a shop instead, and have them properly repaired and balanced. It is the only way to have all bobbins of one diameter when building a set of roving, for I need not point out here that a poorly repaired flyer will not allow the diameter of the bobbin to increase to suit the outlines of the cones.

Another duty that falls to the lot of the efficiency man is to determine the number of doffers necessary to doff a certain number of spindles. When I visit a mill and find three doffers set to doff 24 fine frames of 192 spindles each, I at once form my opinion of the management. When the number of doffers is decreased the cost is increased. I offer this as a suggestion: If the reader has three doffers for the number of spindles given, let him put on six doffers and note the difference it will make in increasing the production and decreasing the cost per pound.

In case the work ran badly, it would be the duty of the textile engineer to make a scientific investigation. For instance, if the ends were continually snapping on the fly frames, and the roving was breaking back in the creels, it would be the duty of such a man to determine whether the trouble was due to the weather, the stock or the mechanical conditions.

This Sherlock Holmes of the mill would no doubt have many puzzling problems to locate in the ring spinning room. When the ends are continually breaking in the spinning room, the case is much harder to locate than in the card room. I have seen spinning run badly with almost perfect roving and ideal weather. Vibration of the ring rails is one of the worst evils in spinning, and one that receives very little consideration as a rule. If the lifter rod bushings are worn or the sampsons of the ring frames are not properly packed, a certain amount of vibration is sure to exist. The operation of the mill creates a certain amount of vibration, and this is added to that caused by any pulley out of balance, especially the loose or driving pulley on the frame. In operation, it is very essential that the spindle, which passes through the ring, should be equidistant from every point on the inside of the ring. A large ring increases the pull on the yarn, and a small ring decreases the tension. Therefore, in case of vibration, it should be clear to the reader that the traveler would offer a jerking action to the yarn and cause many ends to break. These are little things, and are hard to locate, but they are most important.

I remember seeing published, a number of years ago, a comparison between a girl who ran ten sides and one who ran only four sides. The writer stated that the girl who ran ten sides did so because she had system and dexterity. With this statement I must disagree. I have a boy at present running four sides who lacks nothing when it comes to piecing an end, but he can run only four sides. He has the quickness and the efficiency to make the proper motions, and makes a very perfect piecing, so why is he only able to run four sides? My answer is because he will not follow my instructions nor those of the overseer. In the next alley I have a girl running eight sides who pieces an end a little slower than the boy does, but she is able to run twice the number of sides. It is picking the rolls and keeping the work clean in general that makes the good ring spinner. I would not have the boy in my charge for a single day if it was not for the fact that his family of eight works in the mill.

Such cases as these, however, come under the duties of the overseer, because if the operatives refuse to carry out instructions, it is up to the overseer to make them do it. In all my mill experience I have found it an easy matter

to teach dexterity of motion to any spinner, but have found it most difficult to make them understand how a clean and well oiled top roll will aid the spinning. When a spinner neglects the work of cleaning and oiling, the top rolls lag behind the surface speed of the bottom steel roll. In a short time the sharp flutes of the bottom roll roughens to covering of the top rolls, which causes the rolls to lick up, as it is termed. Roll licking causes roller laps, and this of course more than doubles the work of the spinner.

There is no department in a cotton mill where the old saying, "An ounce of prevention is worth more than a pound of cure" counts more than in the spinning room. Is it not a fact that the slow weaver as a rule takes off more cloth than the weaver that is always on the jump? The slow weaver has the ends in the warp straight, the tension right, the loom well oiled, etc., and it is that which makes the difference, and not dexterity of motion.

The efficiency man should insist on having the bobbins in the ring spinning well filled, because the less yarn there is on the spinning bobbins, the more it costs for spooling or winding. Another point, and one that I would like to have every manufacturer consider, is the condition of the warper creels. It is common to find warper creels out of alignment, the skewers running on the wood instead of on metal, which increases the tension on the yarn. Size the yarn on the spools, and from the weight of the full beam discover any unnecessary tension. It is surprising in some mills how the amount of unnecessary tension to unwind the yarn from the spools will affect the weight of the yarn.

The same can be said about the size and drag rolls on the slasher. The amount of yarn taken up by the drag roll should exactly equal the amount passed forward by the size rolls. Still it is often the case that the drag roll is covered without any consideration being given to this point.

Many mill men hold the opinion that successful work depends on the number of times an operation has been performed. It depends entirely on the manner and mental attitude in which the work is done. If an operative performs a certain operation without thinking, it is not necessarily a completely successful one, no matter how many hours or weeks he or she may have been engaged in doing this work. The successful instructor must impress upon the operative that it is careful thought and manipulation in handling the machinery that eliminates unnecessary motions for him, and it is that which makes the operation successful regardless of the actual period he has been engaged on the work or the number of times he has performed the operation. Wash (Mass.)

What Makes the Fingers Break.

EDITOR COTTON:

I would like to ask the following question. I have 36 Mason cards, with 27-inch doffers. I am using a 15-ounce lap, making a 54-grain sliver, with a comb speed of 1512; doffer speed, 8¾ turns per minute. I had some trouble with the fingers breaking and the rivets coming loose causing the blade to strike the doffer. Now I have already cut the speed down to 1080 r. p. m., but I think that a speed of 1310 would be better. I would like to know what some of the good carders who read your Practical Discussion Department would do in a case like this.

A. L. J. (S. C.)

Finds an Answer for "Nemo."

EDITOR COTTON:

I note with interest the subjects which "Nemo (Ga.)" brings up in the December number. It appears that "Nemo" has been neglecting to absorb the information presented to him in COTTON, for as it happens, much of the information he desires I have written myself for your publication.

In regard to the variation in per cent of the various processes through the mill, this was covered in my article entitled "How Even Is Even Running Work?" which was published in the April 1921 issue of COTTON. This was not a haphazard test in one mill, but it covered work extending over a year in over eight mills. Although "Nemo" asks only in regard to picker laps, my article covered the variations in the individual yards of the lap, the individual yards in the cards before and after stripping, the variations in the first and second drawing, slubbers, intermediates, fine frames and spinning. I also gave with this article a small chart visualizing this variation in the different processes.

With reference to his question as to the percentages of waste taken out in the Crighton opener, I covered this in my article on "The Tandem Use of Crighton Openers," in the April 1922 number of COTTON. I will say, in regard to using two processes of picking with the Crighton opener, that we found it necessary to put an evener on the picker we used as a breaker. This is very important for getting good, even laps in the finisher picker.

I should be glad to discuss any feature of this matter with "Nemo" further. Men like us, having similar interests, can accomplish a great deal for all concerned through such discussion.

James Robertson.

Asks for Opinions.

EDITOR COTTON:

I shall appreciate having you publish the opinions of some of your readers as to the range of numbers for warp yarns that they would consider can be satisfactorily spun from 1 1/16-inch staple cotton. W. S. B. (S. C.)

An Old-Timer Says.

(*Continued from page* 217)

he would not join the endless chain, he was selfish and he fell by the wayside.

Do you catch the point? Join the endless chain. Write us how you are doing something in your mill or your room better than you have ever seen anyone else do it, or how you have overcome some trouble.

Guess you have read that parable about "casting bread upon the waters."

How about it?

Study successful superintendents. You will then stand a better chance to be one.

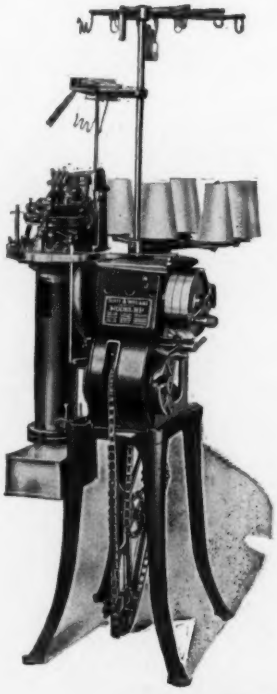
If you are not on the job early yourself, don't expect your second hands and section men to be there early.

The sectional meetings of the Southern Textile Association are "self starters" for bringing out good ideas. Then watch how these ideas are discussed in COTTON.

KNITTING SECTION

NEW MODEL H-H

Producing Ribbed Top Half Hose Complete



Ribbed top made on two sets of needles.
Automatic transfer from ribbed stitch to plain.
Eliminating necessity of skilled help.
Saving of raveling waste which occurs when topped by hand.
Each stocking is dropped from the machine when finished.
Each stocking is automatically started upon the empty needles, producing a French welt without drawing thread or cutting, no ends of any kind to be removed.
Machine is fitted with five yarn fingers.
Provision is made for high spliced heel and double sole.
Provision is made for ring top and ring toe.
Speed of machine about the same as Model K.
Production about twelve stockings per hour on 3¾" 220 needles.
One operator can take care of the same number of machines as Model K.
The machine is built in all gauges.

ESTABLISHED 1865

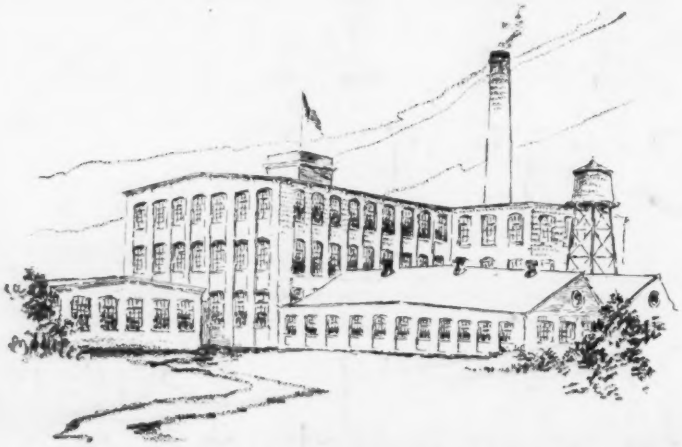
SCOTT & WILLIAMS

INCORPORATED

366 Broadway **New York**

Hamilton, Ont.
Main and McNab Streets

Charlotte
1006 Realty Building



LEESONA
REG. U. S. PAT. OFF.

Your Problem, Our Engineer and "Universal" Winding Machines

We aim to sell, primarily, RESULTS. The word "Result" in our case means the increase and improvement of production, the fostering of economy in manufacture, wherever a mechanical winding process can be used either as the last step or a contributing factor in making some useful article.

Your Problem therefore comes first in our minds, for the only thing we really have to sell is a solution of that problem.

Our Winding Engineers will consult with you, work with you and study your conditions, all without involving you in any obligation, and all with the sole purpose of selling you *results* if he can find the way to assure you that you will *get results.*

Universal Winding Machines which are incidental though necessary factors in attaining results, are capable of producing practically every different desirable result. But for the moment "that's another story."

FRANKLIN PROCESS DYEING WITH UNIVERSAL WINDING

This modern yarn package dyeing process combined with Universal Winding Machines assures better color, economical operating cost and requires the minimum of floor space. You will find it profitable to investigate Universal Wound-Franklin Process Dyed-in-the-package yarn.

Write, telephone or telegraph our nearest office for a "UNIVERSAL" Engineer to come to you.

UNIVERSAL WINDING COMPANY

Providence,
Chicago, Utica,
New York.

LEESONA

BOSTON

Philadelphia,
Charlotte,
Atlanta.

Montreal and Hamilton, Canada

DEPOTS AND OFFICES AT MANCHESTER AND PARIS

Perpetual Yarn Inventory for Knitters

BY EDWARD H. SHIVE.

COST AND PRODUCTION MANAGER, TAUNTON KNITTING CO.

It is a known fact that in the knitted underwear industry, 85 per cent of all money paid out for raw materials goes for the purchase of the basic material used, which is yarn.

Also, there can be no doubt in any manufacturer's mind that in ninety-nine mills out of every one hundred the amount of money tied up in the inventories of yarn in stores represents more cash than is carried by the same mill in its bank.

Each and every mill naturally knows to the very penny its current bank balance. And still, unreasonable as it may seem on the surface, through a personal experience in more than a hundred knitted underwear mills, I know as an absolute and undeniable fact that many executives did not know, to the extent of a number of cases of yarn, just what their yarn inventory amounted to in dollars and cents. In fact the writer became acquainted with forty-four mills out of this group whose financial executives did not know these facts even after the conclusion of investigational work. I have seen their ignorance run into thousands of dollars.

The simple inventory method which I shall outline here

PURCHASING DEPARTMENT Order No. 7877

PUT THIS NO. ON YOUR INVOICE

TAUNTON KNITTING CO.

Taunton, Mass., July 15, 1922

Ship via N.Y.N.H. & H. R.R. *When* Specified below

Terms: 2% 10 Days Following Month, Freight Paid

To Quality Cotton Yarn Co.
Charlotte, N.C.

Please enter our Order for the following

5000	#11/1 Karded Peeler Cones (Queen Quality) Price Quoted, 30¢ per lb., less 2% for cones 2000 lbs. to be delivered in August 3000 lbs. " " " " September

Please acknowledge receipt and advise when you will ship.

Freight Address, WEIRBRANCH, MASS.
Express Address, TAUNTON, MASS.

TAUNTON KNITTING CO.

Per John Smith

A. E. MARTELL CO., BOSTON & PROVIDENCE 67133

FORM 1. PURCHASING DEPARTMENT ORDER SHEET.

TAUNTON KNITTING CO
TAUNTON MASS

YARN INVENTORY RECORD SHEET

SIZE 11/2 SINGLE
KIND KARDED PEELER

DELIVERY SPECIFICATIONS	ON ORDER			INVOICED			RECEIVED IN YARN STORES											USED			BALANCE
	DATE	PURCHASE ORDER NO	POUNDS	DATE	CASE NO	POUNDS	DATE	PURCHASE ORDER NO	CASE NO	YARN TAG NO	KIND	NET POUNDS INVOICED	INVOICED COST PER POUND	TOTAL COST	ACTUAL POUNDS RECEIVED	ACTUAL COST PER POUND	DATE CASE IS USED	DATE	POUNDS	POUNDS ON HAND
2000# August 3000# Sept.	7-15 1922	7877	5000	8/4	57549	799															
				"	57550	797															
				"	57551	798															
				"	57552	793															
				"	57553	791															
				"	57554	797															
				"	57555	795															
						7070	8/10	7877	57549	7957	Quality 6/4s	799+	30	89 67	796		8/23				
							"	"	50	7958	"	797+	"	89 09	793		8/26				
							"	"	51	7959	"	798+	"	89 38	796		8/30				
							"	"	52	7960	"	793	"	87 90	791						
							"	"	53	7961	"	791	"	87 30	788						
							"	"	54	7962	"	797+	"	89 09	793						
							"	"	55	7963	"	795	"	88 50	793	.303					
												2070		620 92	7050			8/30		2070
																		8/23	796	1774
																		8/26	793	1481
																		8/2	796	1185
																			889	

COLUMN A → COLUMN B → COLUMN C → COLUMN D → COLUMN E → COLUMN F →

FORM 2. YARN INVENTORY RECORD SHEET.

has been successfully placed and satisfactorily operated in thirty-two knitted underwear mills. The forty-four mills mentioned above might, too, have availed themselves of the opportunity of installing these inventory methods had they so desired.

Only last week one of the largest manufacturers of underwear in this country visited with me and frankly explained that his mill had nothing in the way of a perpetual yarn inventory. They bought their yarn by "hit and miss" methods, and knitted them up much in the same way.

By way of example he said that 18s combed peeler yarn was one of their regular numbers, and that he could not tell within ten cases one way or the other just what he had on hand; in fact, only recently he thought he had ten cases on hand, and through physical effort he found there was not a single case in stock, and in another instance he thought a certain number of yarn was all gone, and after ordering a supply, he found six or more cases in the storehouse. He wanted to know if I could help him, so a copy of this story is for him.

The proper inventory methods for the handling of yarn in and out of stores is a real necessity if we are to plan and schedule our winding and cloth knitting operations.

The methods, and worked out forms, which are carefully explained hereinafter, I believe are so simple and adaptable as well as complete and comprehensive as to allow any manufacturer to be guided thereby in the installation of proper yarn stores inventories in his own mill.

Purchasing Department Order Sheet.

After the yarn requirement has been determined by the production department, quotations are asked for from several of the spinners who produce the quality of yarn desired, and all things being equal the order is usually given to the mill offering the lowest price.

The order sheet, shown in Form 1, is a very convenient one, simple, yet answering the necessary requirements. The order sheets are printed in duplicate, the original sheet, preferably white, and the duplicate sheet of some light color like yellow. The sheets are padded about fifty original and fifty duplicate sheets to the pad. The printer will print the order number serially, and this will prevent any duplication of order sheets which may occur if numbered by hand. In preparing these sheets for the pads the printer allows a margin at the left side of the sheet suitably punched for inserting in the loose leaf binder. If desired, the white sheet may be perforated to allow it to be torn away from the binding edge, leaving it as shown in Form 1. The yellow duplicate is not reproduced.

The original sheet is properly signed by the purchasing executive, and mailed to the vendor. The duplicate sheet is filed in a loose leaf binder containing an index, under the caption "Cotton Yarn." Before filing the duplicate in the binder, the delivery specifications, date of order, purchase order number, and pounds of yarn ordered should be properly entered on Form 2, columns A and B, respectively.

Yarn Inventory Record Sheet.

One such record sheet in a size about 11 by 15 inches is made out for each style of yarn purchased by the mill, the sheet being printed on both sides, and in the small mill it is possible that on many styles of yarn only one sheet will be necessary for a period of six months or one year. This sheet is practical and the reader can see for himself that each column has a true story to tell, and is void of any duplication. It is punched for loose leaf binding.

Vendor's Invoice.

The spinner having received the order from the purchasing department, now makes a shipment of yarn. The invoice is then mailed to the mill and the invoice is usually received in advance of the shipment of yarn. The invoice should immediately be checked with the duplicate order on file as regards price, terms, shipping directions, etc.; also the invoice itself as to correctness of weights and extensions. The invoice, finally approved, should be posted to the Charge Register as shown in Form 7.

The invoice should then be rubber-stamped, and entered as shown, order checked by order number, entries checked by mark, initials of the individual checking, page and line number of entry in the Accounts Payable (Charge Register) and later, the date on which the cases of yarn were received, and the date on which the invoice was paid.

The stamp "Discount Bill Payable," is a very handy mark and may save the mill many dollars in discount taken, which, if the invoice was not stamped, may otherwise escape attention till past the discount allowed date.

From the invoice, also, we get the data which is posted on Form 2, column C. This information is easily obtained, and furnishes us with the knowledge of just when and how much yarn has been shipped, but not received.

When the invoice is first received, and while being checked, the same clerk can fill in the preliminary information upon the yarn case ticket in duplicate as shown on Form 4.

Yarn Case Ticket.

These tickets, four by six inches in size, are serially numbered in duplicate, the original being on white, and the duplicate of a light colored shade. These tickets are filled in as shown on the top part of the ticket down as far as the double ruled line in the center; the information being furnished from the invoice.

The white ticket, which shows the price per pound and total value of the case, is then filed in a drawer behind an index marked "Yarn in Transit." The duplicate or colored ticket (with no price per pound or value filled in) is sent to the receiving clerk, who holds these duplicate tickets in his file until the cases of yarn are received.

When the cases of yarn are received, he roughly weighs each case for gross weight to ascertain if there is any great difference between his weight and the invoiced weight as shown on the duplicate yarn case ticket. Should there be a worth-while discrepancy, he will have the case emptied, and ascertain the correct net weight of yarn at least. If rough gross weight is practically the same as invoiced weight, he will pass the cases of yarn along to the yarn storage room after he has made out a receiving blank slip as shown on Form 5.

The receiving clerk goes to his file and, matching the case number on the duplicate yarn case ticket with the case number stenciled on the case of yarn, fills in upon the ticket his initials (Received by) and (the Date Received) and tacks the yarn case ticket on the case.

Receiving Blank Slip.

These slips are made up in bound pad form. The original and duplicate are serially numbered. The pads of slips are kept by the receiving clerk, and records of all yarn received are entered thereon, the original slip being sent to the office at the end of the day, and the carbon duplicate

INVOICE.

QUALITY COTTON YARN COMPANY
CHARLOTTE, N. C.

August 4, 1922
Terms 2%--Sept. 10th
Your order No. 7877
Via N.Y.N.H. & H. R.R.
Paid

SOLD TO
Taunton Knitting Co.
Taunton, Mass.

Case Nos.	Kind of Yarn	Gross	Tare	Net	Price	Amount	Deduction	Amount
57549	#11 Karded Peeler	411	106	305				
50	" " "	406	103	303				
51	" " "	409	105	304				
52	" " "	401	102	299				
53	" " "	399	102	297				
54	" " "	407	104	303				
55	" " "	408	107	301				
Yarn Case ticket Numbers 2957 to 2963 Inc.		2841	729	2112	30	633.60		
				Less 2%	Cones		12.67	
								$620.93

ORDER CHECKED 7877
ENTER CHECKED ✓
ENTERED E.H.S.
ACCTS. PAY 103
REC'D 8/20/1922
PAID 9/10/1922

DISCOUNT BILL
Payable Sept 10th

FORM 3. VENDOR'S INVOICE.

retained as a record for the receiving clerk.

When the receiving blank slip arrives at the office, the clerk in charge of yarn inventories can remove the white yarn case ticket in the drawer file from the "Yarn in Transit" index to the index by proper number of the yarn now received into the stores, and at the same time the necessary data can be posted on Form 2, column D, from the receiving blank slip and the white yarn case ticket.

Yarn Usage Procedure.

The winding department when desiring to wind a case of certain yarn, orders it from the yarn stores (no requisition being required). The person in charge of the cases of yarn on storage will take out the case of yarn oldest in stock, and will first weigh the case for gross, and place his weight figures on the colored case ticket which is tacked on the case, and also show the date and his initials. He will then proceed to open the case, saving all nails and top boards from the case. Then he will count the number of cones of yarn out of the case into a large fiber truck, removing the wrapping papers from the cones as he places the yarn in the truck. He now enters the number of cones upon the colored ticket, and from previously made tests he will have ascertained the different spinner's cone and cone paper weights. Therefore, the person who has just counted the cones can determine the weight of the cones and cone wrapping paper. He then places this weight figure on the colored ticket. After this he weighs the empty case with the case lining paper, including the top boards and nails, and places this figure on the colored ticket, and by adding the case and lining weights to the cone and paper weights, and subtracting this total from the gross opening weight, he accurately determines the net weight of yarn, and this figure is also shown on the colored ticket. The colored ticket is now removed from the yarn case, and sent with the truck of yarn to the winding department.

The winder operator now begins winding the cones of

TAUNTON KNITTING COMPANY

Yarn Tag No. 2958 Case No. 57550 Size / Kind 11 Karded Peeler

Ordered From Quality Cotton Yarn Co. Our Order No. 7877

Shipped From above Date Shipped 8/4/22

Invoice Weight	Gross	Tare	Allowance	Net
	406	103	6+ CONES 2%	297-

Invoice Price per lb. 30¢ Total Value 89.09

Received by Date Received

Date Case Opened By Number of Cones / Cops

Opening Weight	Gross	Case and Lining	Cops or Cones & Paper	Net

Wound By Date Wound

Remarks

FORM 4. YARN CASE TICKET (WHITE.)

TAUNTON KNITTING COMPANY

Yarn Tag No. 2958 Case No. 57550 Size / Kind 11 Karded Peeler

Ordered From Quality Cotton Yarn Co. Our Order No. 7877

Shipped From " " " " Date Shipped 8/4/22

Invoice Weight	Gross	Tare	Allowance	Net
	406	103	6 CONES 2%	297

Invoice Price per lb. Total Value

Received by E.R.S. Date Received 8/20/22

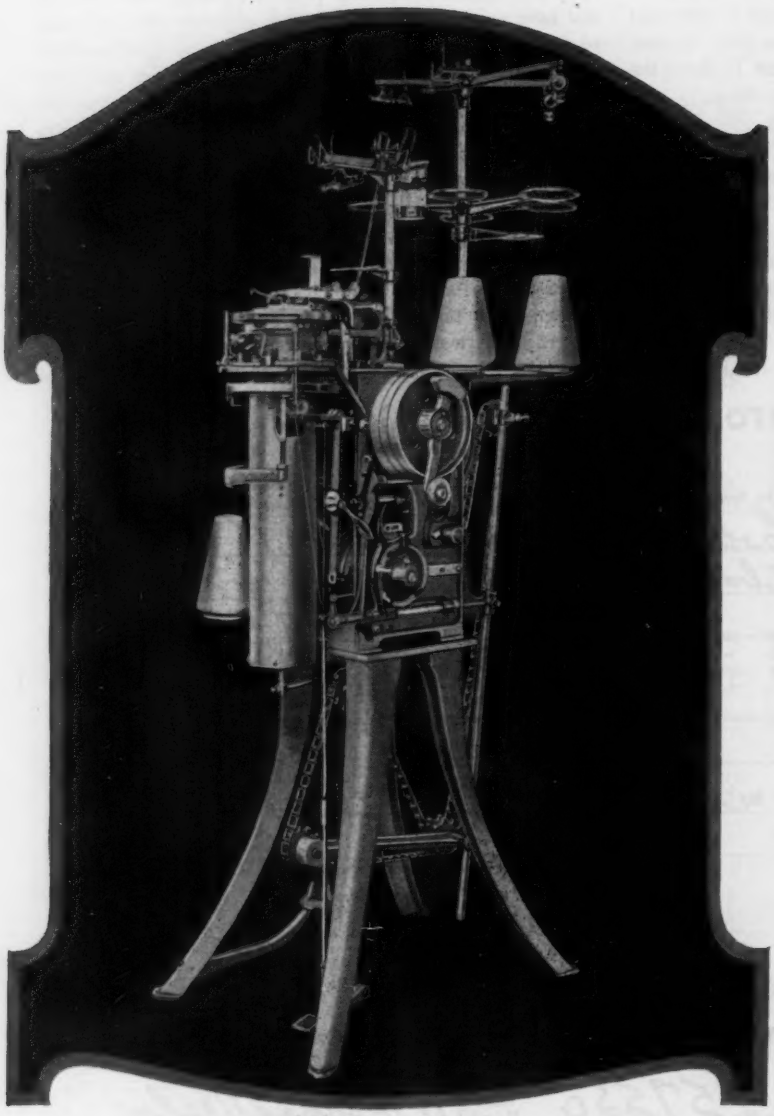
Date Case Opened 8/25 By J.K.W. Number of Cones / ~~Cops~~ 158

Opening Weight	Gross	Case and Lining	Cops or Cones & Paper	Net
	406	105	8	293

Wound By Mary D. Date Wound 8/26

Remarks

FORM 4. DUPLICATE YARN CASE TICKET (LIGHT GREEN.)



WILDMAN
THE WORLD'S STANDARD

Wildman Spring Needle Knitter

In every piece and part of Wildman Knitting Machinery is embodied a generation of experience in anticipating and meeting the needs of hosiery manufacturers.

It is your assurance that your hosiery will always live up to your highest standards of quality—that your production will maintain the accustomed volume.

Such certainty is well worth having.

We are now able to sell Wildman Spring Needle Knitters in all foreign countries.

On request we will send the "Wildman Spring Needle Knitter Machine Instruction Book," giving detailed information and description of every important part of the machine.

We have issued a very complete and informative book "The Science of Knitting." Price $3.00.

TRADE MFG MARK

WILDMAN MFG. CO.

NORRISTOWN, PA.

No. 1000 **RECEIVING BLANK SLIP** Date 8/20/ 19 22

TAUNTON KNITTING CO. Rec'd Via N.Y. N.H. & H. R.R.

Rec'd From Quality Cotton Yarn Co Charges Prepaid Ups Collect

CASE NO.	GROSS	TARE	NET	DESCRIPTION
57 549	411	106	305	
50	406	103	303	
51	409	105	304	#11/1 Karded Peeler Cones.
52	401	102	299	
53	399	102	297	
54	407	104	303	
55	408	107	301.	

Checked by J.E.W. Received by E.R.S.

A. E. MARTELL CO., KEENE, N. H. & PROVIDENCE, R. I.

FORM 5. RECEIVING BLANK SLIP.

yarn as taken from the truck. This operation is piece work labor, and she is paid only for the net amount of yarn as received (not as invoiced). When the truck of yarn has all been wound, the operator places her name on the colored ticket; also shows date wound and at the end of each day the colored tickets for cases of yarn wound are sent to the office.

Upon receipt of these tickets in the office, the yarn inventory clerk posts the information figures in Form 2, columns E and F, respectively, at the same time removing the white yarn case ticket in the drawer file from the index of yarn on hand to an index headed "Current Month Usage."

The colored yarn ticket is now turned over to the pay roll clerk, from which the wages of the winder operator are determined. It should be noticed that by this system the usage or production is absolutely tied up with the pay roll and no errors may possibly slip in.

At the end of each month the white yarn tickets are removed from the index "Current Month Usage" in the drawer file, and by numbers of yarn the usage amount and total cost is recapitulated on the "Report of Yarn Usage Sheet," Form 6.

Report of Yarn Usage Sheet.

This sheet is made up monthly from the total of white yarn tickets representing the cases of yarn taken from yarn stores, and wound during the current month. The total of this sheet is a deduction from yarn stores, and is naturally entered lastly in the general ledger as a credit to "yarn stores account," and a debit to "goods in process account."

Charge Register.

The charge or voucher register is the book of original entries for all disbursements. It is of the loose leaf variety with pages approximately 14 by 17 inches in size. The section in Form 7 shows the ruling and method of entries in reduced size. Just as soon as the invoice for yarn is received it is entered in this book, and the amount posted to the credit column "Accounts Payable," and debit column "Yarn." At the end of the month the total amount of the "Yarn" column is posted to the "Yarn Stores" account on the debit side of the general ledger.

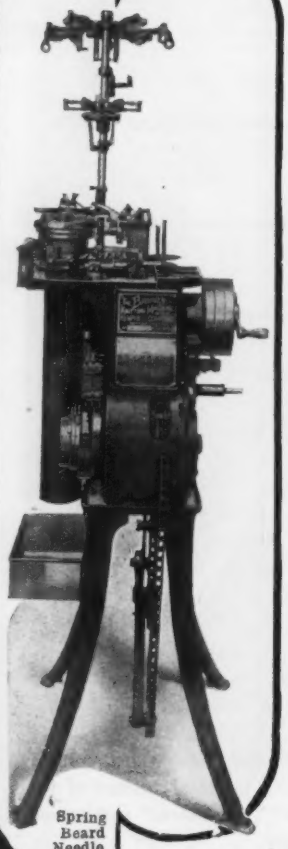
TAUNTON KNITTING COMPANY

REPORT OF YARN USAGE SHEET FOR AUGUST 1922

			TOTAL POUNDS	TOTAL VALUE	
3	CASES	#11 Karded Peeler #2957-2958-2959	885	268	14
		ETC. ETC.			

FORM 6. REPORT OF YARN USAGE SHEET.

The Banner Full Automatic Hosiery Machines



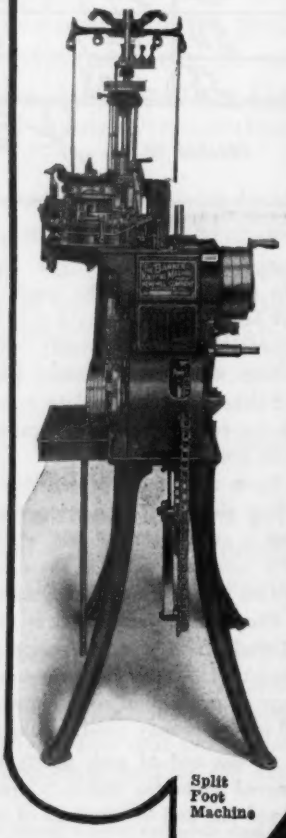
Spring Beard Needle Machine

Simplicity
Quality
Speed
Production

All Parts Accessible from the Front of Machine

We have just placed on the Market two new models– The Spring Beard Needle, built in sizes of 3" to 3 3-4" diameter, and a new model —Split Foot Machine, built in sizes of 3 1-4" and 3 1-2" diameter.

Write for descriptive catalog



Split Foot Machine

HEMPHILL COMPANY

MAIN OFFICE AND FACTORY PAWTUCKET RHODE ISLAND

TRADE MARK

SOUTHERN OFFICE and SHOW ROOMS
912 James Bldg.
CHATTANOOGA, TENN.

PHILADELPHIA OFFICE and SHOW ROOMS
208-9-10 COLONIAL TRUST BLDG.
PHILADELPHIA, PA.

Sheet #1 MONTH OF AUGUST 1922

CHARGE REGISTER

APPROVED AND ADOPTED BY THE KNIT GOODS MANUFACTURERS OF AMERICA UTICA, N. Y., DECEMBER, 1918.

Form C R–1

No	DATE	CREDITOR	CREDIT: ACCOUNTS PAYABLE	CREDIT: GENERAL LEDGER	DATE PAID	DEBIT MATERIALS: 1–YARN	2–TRIMMINGS	3–PAPER BOX MATERIALS	4–CASING LUMBER	5–DYE HOUSE CHEMICALS	6–FUEL	7–MISC. STORES	8–NEEDLES
00	8/1	O'Clean Cotton Co.	200 00				200 00						
01	8/2	Paper Box Mfg Co.	25 50					25 50					
02	"	Century Chemical Co.	103 00							103 00			
03	8/4	Quality Cotton Yarn Co.	620 93		9–10	620 93							
04	"	Knickerbocker Coal Co.	1020 78								1020 78		
05		Southern Stock Co.	775 00						775 00				
06		Etc - Etc											
07													
08													
48													
49													
	TOTAL					✓ 6 2 0 93							

FORM 7. THE CHARGE REGISTER.

GENERAL LEDGER SHEET

SHEET NO. 2 ACCOUNT NO. 12

NAME Cotton Yarn Stores

DATE 1922			FOLIO	✓	CHARGES	DATE 1922		FOLIO	✓	CREDITS
		Balance			1 0 0 0 00					
Aug	31		C.R. 1		6 2 0 93	Aug	31	Used		2 6 8 14
		1352.79			1 6 2 0 93					2 6 8 14

FORM 8. GENERAL LEDGER SHEET.

HOSIERY PACKING

TOE STICKERS
RIDER TICKETS
BOX END LABELS
BANDS

DEPENDABLE SERVICE
HIGHEST QUALITY
LOWEST PRICES

You know the many sales advantages arising from a uniformly packed TRADE MARKED line and if you have not already adopted this worthwhile packing feature let us assist you by submitting sketches of appropriate designs.

If you are already using **seals, riders, etc.,** send samples and quantities for quotation. Prompt attention to inquiries.

KIRBY-COGESHALL CO.
MILWAUKEE WISCONSIN

"Royal-Chicago"
PRODUCTS

STANDARDIZED INDUSTRIAL SEATING

Seating the worker so that each can produce more efficiently need not mean a variety of special chairs or stools. . . . . The posture requirements of the individual worker may be met by *standardizing* on one type of seating.

This type, if adjustable to height and with an adjustable back-rest, enables the seating to be shifted to different operations and be equally adapted to workers at each.

It reduces both expense and purchasing effort.

FS-14 Patented Adjustable

ROYAL METAL MFG. COMPANY
Builders of Correct Industrial Seating
2325-29 S. Western Ave.
CHICAGO, ILLINOIS.

FS-15 Patented Adjustable

An Ever
Increasing Demand
For
"AMTEX"
SPINNING, TWISTING AND SPOOLER TAPES
From
Southern Spinners
THE QUALITY AND PRICE RECOMMEND THEM
Manufactured by
AMERICAN TEXTILE BANDING CO., Inc.
GERMANTOWN, PHILADELPHIA, PENNA.
Sold in the South by
Charlotte Supply Co., Charlotte, N. C.
James Supply Co., Chattanooga, Tenn.
Montgomery & Crawford, Spartanburg, S. C.

The Walke Box Company, Inc.
NORFOLK, VA.
Manufacturers of
NORTH CAROLINA PINE BOX SHOOKS

Bradley Stencil Machine

The Bradley Stencil Machine makes Stencils in half a minute at reduced cost of 1-10c each. Write for catalogue and price list.

In universal use by thousands of manufacturers and shippers.

Oil Paper, Stencil Paper and Inks. Bradley Ball Stencil Pot uses Liquid Ink for marking and stenciling. Price 60c or $6.00 per doz. Manufacturers of Oil Stencil Papers.

Write for Prices and Samples

A. J. BRADLEY MFG. CO.
99 Beekman Street NEW YORK

General Ledger Sheet.

This general ledger is a loose-leaf book with pages about 9¼ by 12 inches. This is a stock form and can be practically applied to any office. The debit entries are posted from the Charge Register, Form 7, and the credit entries are posted from the Report of Yarn Usage Sheet, Form 6.

It will be noticed that by this method the balance figure of the "Yarn Stores" account in the general ledger equals the cost value of the yarn actually on hand in the yarn storehouse.

Among the Knitting Mills

Improvements during the new year are planned in an increase in capitalization from $2,500,000 to $4,000,000 by the United Hosiery Mills Corporation, Chattanooga, Tenn., it is announced. No definite announcement has been made as to what these improvements will comprise.

Another Chattanooga hosiery mill to increase its capital stock recently was the Davenport Hosiery Mills which now has a capitalization of $200,000. Reports state that this company is planning a $100,000 addition to its plant.

Additions to the Parsley & Tanner Knitting Mill, Forest City, N. C., are being pushed to completion, and when finished, will give the plant operating space for 300 machines. The addition measures 40 by 40 feet. This mill produces men's half-hose in three styles, cotton and mercerized.

The May Hosiery Mills, Inc., Burlington, N. C., successors to the Daisy Hosiery Mills, are working on the construction of a new office, warehouse and knitting building, which will be 45 by 106 feet, three stories. In connection with this, the National Dye Works, a subsidary of the May Hosiery Mills, Inc., will erect a 40 x 100 foot building, two stories and basement. J. E. Sirrine & Co., Greenville, S. C., are the architects.

Hygrade Hosiery Mills, Dayton, Tenn., has been organized with $50,000 capital, with W. H. Rigsby, W. F. Jewell, Truman Cox, T. O. Jewell and B. V. Bryant as incorporators.

It is reported that the Pinewood (Tenn.) Knitting Mills will establish a branch at Mount Pleasant, Tenn.

Excavation work has been started for a new two-story brick mill for the Princeton (W. Va.) Hosiery Mills Co., to be 48 x 118 feet and to cost about $25,000.

The Paramount Knitting Co., Kankakee, Ill., is revamping its old boiler house building and installing a coal bunker at the local plant. Lockwood, Greene & Co., of Boston and Chicago, are the engineers.

Asheville Knitting Mills, Asheville, N. C., have been incorporated with a $50,000 capital. R. E. Frazier, W. Y. Frazier, and H. Q. Alexander are the stockholders.

Contract has been awarded for the construction of 100 houses for operatives of the mill of W. B. Davis & Son, Inc., Fort Payne, Ala. These houses will contain from five to eight rooms each, and will be modern in every respect. Recently 100 houses were built there, and with the completion of those just let to contract, there will be 200 new dwellings erected in less than 18 months.

The Clark Knitting Co., Warren, Ohio, a new concern, expects to begin operations in January, on men's and women's mercerized hosiery. They are erecting a two-story frame building, 40 x 30 feet.

The Mission Knitting Works, San Francisco, Cal., have moved into larger quarters and are installing additional machinery for increased production.

Rome Hosiery Mills, Rome, Ga., have increased the capital stock of the company from $250,000 to $750,000.

John E. Hanifen Co., Philadelphia, Pa., manufacturer of knit goods specialties, has taken title to a five-story mill building at Thompson and Oxford Streets, for a consideration of about $30,000.

The Swansdown Knitting Co., Little Falls, N. Y., has filed notice of increase in capital from $750,000 to $1,500,000, for general expansion in operations.

The Rhode Island Knitting Co., Woonsocket, R. I., has work under way on the construction of its two-story mill addition, 40 x 100 feet, estimated to cost about $50,000.

Acoma Textile Mills, Inc., 478 Johnson Avenue, Brooklyn, N. Y., headed by C. Heller, O. Winkler and J. Nadler, has filed notice of incorporation under state laws, to operate with capital of $50,000, and succeed to the former business conducted under this same name, at location noted.

Ritz Knitting Mills, New York, N. Y., has been incorporated with a capital of $20,000, to operate a local plant for the manufacture of knit goods. The company is headed by J. Schwartz; and is represented by Goldstein & Walder, 1133 Broadway, New York.

Vanwie & Chase Corporation, Gloversville, N. Y., will operate a local works for the manufacture of cotton mittens, and kindred specialties. The company was recently organized with a capital of $150,000, by O. and J. E. Chase and W. A. Vanwie.

Oakland Knitting Co., 403 West Jefferson Street, Detroit, Mich., has arranged for an increase in capital to $30,000, for improvements and expansion in operations at its mill.

Intercity Knitting Mills, Inc., Brooklyn, N. Y., has been incorporated with a capital of $100,000, to manufacture knit goods products. The company is headed by E. Lipsky, 30 Johnson Avenue, Brooklyn, N. Y.

Rudomin Knitting Mills, Brooklyn, N. Y., has been organized by S. and I. Rudomin and S. Shifpet, to operate a local mill for the manufacture of knit goods products. The company is represented by M. C. Gelies, 1140 Broadway, New York.

Paramount Knitting Mills, Philadelphia, Pa., have been organized with a capital of $50,000. The company is planning for the early operation of a local mill. L. M. Rosen, North Ninth Street, Philadelphia, is head.

Wyoma Knitting Mills, Inc., 493 Vermont Street, Brooklyn, N. Y., is said to be planning for the early installation of new equipment at its plant, for increased production.

Bud Knitting Mills, New York, N. Y., have been organized recently, to operate a local plant for the manufacture of infants knit goods specialties. M. Sidel, M. A. Ritter and S. E. Fink head the company, it is represented by Nathan Ruttenberg, 165 Broadway, New York.

Chenango Textile Corporation, Binghampton, N. Y., has been organized with a capital of $15,000, to operate a local plant for the manufacture of textile products. The company is headed by R. A. MacLean and T. E. Halle; and represented by F. Knorr, Albany, N. Y.

Manmore Knitting Mills, New York, N. Y., headed by I. Morrell and M. Manowitz, have organized to conduct a local mill for the manufacture of a varied line of textile specialties. A. P. Wilkes, 63 Park Row, New York, is company representative.

Allentown Knit Fabrics Co., Allentown, Pa., has been organized with a capital of $100,000. The company is planning to establish a local mill for the manufacture of knit goods. R. Schreiber, 230 Fifth Avenue, is head.

The Yarn Market

Two-ply 30s carded warp yarns were quoted in this report last month at a bid price of 57 cents, with a selling quotation of 60 cents being firmly asked by the spinners. These quotations were as of November 17.

One month later, two-ply 30s carded warp yarns were going at a price between three and five cents under these quotations, and the control going over to the opposite side of the chamber.

This yarn is used as an illustration representative of the conduct of the entire group, as well as it could be ascertained and recorded by close observers. From the peak in the middle of November, with spinners apparently sitting on top of the world, the germ of lassitude in buying, or something, bit the consuming end of the market and prices began scaling off, gradually.

This refers to the market taken as a unit, and the misconstruction must not be made that it was absolute and too deeply penetrating that the effects of the ennui bug's stinger went into all departments of the market. Some business, good business, was reported on a number of occasions and in different yarns, and it seemed innoculation had been taken and was effectively operating in certain divisions of the list at certain times. No line of demarkation, however, can be drawn either between sections of the list or the calendar, as everything seemed affected at one time or another, while no fatalities were reported as resulting from the scourge. It was apparent, however, that through late November and early December, the general line of rates was off throughout the whole list from that prevailing around November 13 or 14.

Inquiry developed that a large percentage of those who were buying were acting all with a single thought: to make purchases only sufficient to cover immediate or nearby requirements. It was further evidenced that quite a number of possible consumers were very well stocked in their own warehouses for some little period. It seemed also that the Philadelphia dealers were somewhat in this class themselves, as no little spot yarn was in evidence during the month.

These factors, together with the fact that there was no desire on the part of the buyer's to load up this year's inventory with supplies, in a declining market, contributed toward the lowering of the standards of price. Shopping around seemed to be quite evident in the activities of the buyers who were interested, and the quotations here appended do not mean that sales were not made under these rates upon occasion.

When the government crop condition report came out in December, it was apparent that its effects had been previously discounted and no violent reaction resulted in the market.

Considering the increased activity and better conditions of the country's industries generally, experienced factors believe that after the turn of the year, and with the market established on a comparatively firm basis, the first months of 1923 should show some good business.

Following are quotations on the Philadelphia market on December 17:

Single Skeins.

4s to 8s	38½	10s	39½
12s	40½	14s	41
16s	41½	20s	43½ @44
24s	45½	26s	47½
30s	51 @52		

Single Warps.

8s	39½	10s	40½
12s	41	14s	42
16s	42½	20s	43½ @44
26s	48½	30s	52 @53
40s	60 @61		

Carpet and Upholstery Yarn in Skeins.

8s and 9s 3-4 slack	33½
8-3-4 tinged tubes	37½
8-3-4 hard white twist	38
8-3-4 hard twist waste	37

Two-Ply Skeins.

8s	39½	10s	40½
12s	41½	14s	42½
16s	43½	20s	45 @46
24s	47 @48	26s	49
30s	53 @54	40s	61 @62

Two-Ply Warps.

8s	39½	10s	40½
12s	41½	14s	42½
16s	43½	20s	45 @46
24s	48	26s	50
30s	54 @55	40s	61 @62

Frame Spun Carded Yarn on Cones.

8s	38	10s	38 @38½
12s	39	14s	39½
16s	40	18s	41
20s	41½	22s	41½
24s	43 @44	26s	45
30s	47 @48	40s	59 @61
30s double carded			50 @52
30s tying-in			47

Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	60	20s	62
24s	65	30s	65 @68
40s	78 @80	50s	88 @90
60s	$1.00	70s	$1.10
80s	$1.30		

Mule Spun Carded Yarn.

10s	43	12s	44
14s	45	16s	46
18s	47	20s	48
24s	50	26s	52
30s	56	40s	70

Mule Spun Combed Peeler Yarn on Cones.

10s	53	12s	54
14s	55	16s	57
18s	58	20s	60
22s	63	26s	68
28s	72	30s	75
36s	85	38s	87
40s	90 @95		

A useful table of weights, numbers, and breaking strength of cotton yarns is being mailed out by Wm. C. Robinson & Son Co., 32 South St., Baltimore, Md. This table covers yarns from 6s to 114s, giving the weight in grains of one skein, the number of the yarn, and the breaking strength of fair, good, and extra quality, of one skein of 120 yards (80 turns of 1½-yard reel) from one bobbin. This is a new and novel idea, and the company states they will be glad to supply these tables to anyone in the industries interested. They maintain branches at Charlotte and Greenville.

Eastern Representatives:
Cameron & Pfingst
Reading, Pa.

Eastern Representatives:
Cameron & Pfingst
Philadelphia, Pa.

"REG. U. S. PAT. OFF."

Mercerized Yarns

20s—80s Two Ply
NATURAL AND GASSED

DIXIE MERCERIZING CO.
CHATTANOOGA, TENN.

Western Representatives:
Kentucky Textile Products Co.
Chicago, Ill.

Canadian Representatives:
Slater & Company
Toronto, Canada

Western Representatives:
Kentucky Textile Products Co.
Louisville, Ky.

Machine Builders Quality

KNITTING Machine Builders have to be "fussy" about the quality of needles they send out in their new machines.

That we supply the bulk of needles used in filling new Latch Knitting Machines is the strongest recommendation possible for "Excelsior" uniformity in dimension, finish and service.

You can secure Machine Builders Quality if you specify "Excelsior"—for Excelsior Needles are made in one quality only.

SO thoroughly are the standards of dimension and finish maintained through all the branches of the Torrington Company that whether you buy Torrington Needles in Buenos Aires, Philadelphia or Nottingham, you will find the quality uniformly excellent.

THE TORRINGTON COMPANY

— EXCELSIOR PLANT —

TORRINGTON, CONN.

C. B. BARKER & CO., LTD.
140-144 W. 22nd STREET,
NEW YORK.

MANUFACTURERS SUPPLIES CO.,
CHERRY AND JUNIPER STS.,
PHILADELPHIA.

The Knit Goods Market

Spurts and recessions followed one another in close succession in the knit goods market in the closing weeks of 1922. With cotton seven cents higher than in December, 1921, there was an inspiration for jobbers to operate in cotton hosiery and underwear, particularly as the advance in raw materials was not reflected to any material extent in the higher price of the goods. Merchandise for future is more attractive when it can be bought under replacement, and as no knitted goods have been sold to distributors at anywhere near such value, the public have suffered little from the higher prices of raw material, in which are to be included, of course, wool and silk. December witnessed very general buying of cotton underwear for the next heavyweight season, and it may be said that sales for the first month following the formal opening were far above those for a corresponding period in which buying was started for the ensuing season.

Buying of hosiery has been on a very conservative basis since jobbers covered for about 50 per cent of their spring wants, and little improvement is to be looked for until after the middle of January, when, it is probable, there will be a general advance, perhaps more radical than that which was made in November and previously.

Yarns sagged three to five cents on suspended buying; not because of the temporary decline in cotton, subsequently recovering in part. The advances in finished goods will be resisted, so that, while logically there should be a spurt during January and February, it is as likely there will be a display of extraordinary caution on the part of jobbers, which, however, does not promise to be reflected in a tardiness of advances in yarn. Jobbers have admitted they believe there can be no escape from higher prices, but say they would rather pay more and operate on a shrunken per centum of margin, if necessary, than take a hazard on goods under contract.

Considering the employment situation and increases in wages, and considering also the strong statistical position of cotton, it would seem that cotton goods will command prices commensurate with the higher cost of production. But there remains the question whether advances may not be held in check by ultra conservatism and operating on a month-to-month basis.

Several jobbers say their banks have advised them to approach the last six months of next year with light stocks. Inquiry at an important bank as to why the last half of 1923 had been singled out as a dangerous period brought the reply: "There are so many radicals in Congress that there is danger of legislation adverse to business interests," and that it may be at least six months before the foreign situation will have cleared up.

However, the public will be a good customer for the kind of goods it wants and these goods can be sold at prices showing a fair return. Ruinous prices will continue as to lines the output of which is in excess of public consumption, and in this class there have been certain lines of silk hosiery staples. It is held in the trade that mills which have been selling hosiery in fair to big volume owned yarn contracted for at well under current quotations, except they have distinctive or featured lines, or numbers which are well established in the trade. Owners of low price yarn have been able to name prices approximately satisfactory to buyers.

Mills not having bought advantageously will have difficulty in meeting competition with the few which did buy opportunely, and as some of the latter have made no price advances for the first half of 1923, and although they may supply only a small part of the season demand, jobbers will be industriously persistent in bearing prices among the mills not fortunately situated as to yarn, for meeting the competition which exists by reason of the established low prices of the minority of mills. Jobbers therefore may be disposed to hold commitments down to bare needs as they develop.

Jobbers say they believe manufacturers bought well ahead of yarn when prices were lower and that therefore no sharp advances over last season will be necessary. Jobbers hold also they will be safe in deferring their commitments until at least retailers show a decided interest, as, they say, "there is plenty of machinery to make up goods on short notice."

Cotton hosiery just now appears to be a less speculative commodity than silk or wool. A leading seller in the primary market declares, "we are selling as much cotton hosiery as ever," contradicting predictions which frequently were made that it was being pushed aside in the popularity of silk goods. For several months cotton hosiery has been commanding better prices relatively than silk, and December developments disclosed a disappointing situation in high grade domestic wool goods, which were being bowled over by the sacrificing of British hosiery of silk and wool combination. Some months ago a southern mill continued the manufacture of a popular low price line of cotton stockings, nothwithstanding there were practically no sales. The mill accumulated about 90,000 dozens, which the trade was refusing to buy at above 90 cents. The manufacturer owned yarn bought right, believed in the future, and now is selling at a dollar a dozen for spot delivery, five cents a dozen more for spring, rise 7½ cents, fall five. He is coming out $9,000 to the good for having waited for the anticipated turn in the market.

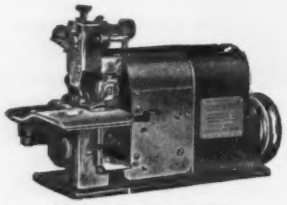
While jobbers were resisting prices which showed no adequate return to mills, some, it is revealed, sold short of merchandise. One such jobber when he came to market recently for a few cases of ladies mercerized and found the price had been advanced 12½ cents a dozen said he could not pay it; that he had sold retailers on the basis of the former price and would have to deliver the goods at the figures which he had named. He bought, and paid the new price, and also paid the penalty for his tardiness. But he carried away a lesson he will not soon forget. The mill selling agent put the matter up to him in this way:

"When you were not buying goods you were telling us of lower prices to come. At the same time spinners were telling us that yarn prices would be higher. Knowing that as long as you felt a decline was in prospect you would not buy goods, we did not feel justified in buying yarn. Like yourselves, we waited for developments. You misled us by your insistence that prices were too high and would

MERROWING

ESTABLISHED 1838

Makers of



MERROW
Reg. Trade Mark

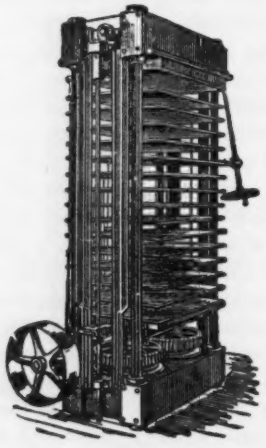
The Merrow High Speed Overseaming Overedging and Shell Stitch Machines.

MERROWISE FOR EFFICIENCY IT MEANS

MAXIMUM PRODUCTION
MINIMUM EXPENSE
UNEXCELLED QUALITY OF WORK

THE MERROW MACHINE COMPANY

16 LAUREL ST., HARTFORD, CONN., U. S. A.



RELIANCE

Hot Plate Screw Press

FOR

Hosiery and Underwear

Write for Catalog and Prices

Reliance Machine Works

FRANKFORD, PHILA.

JOSEPH T. PEARSON & SONS CO.

MANUFACTURERS OF

BONE DRY
HOSIERY FINISHING BOARDS

THAT WORK ABSOLUTELY SMOOTH

PROMPT SERVICE—RIGHT PRICES

1815 E. Boston Avenue, Philadelphia

GENERAL MACHINE WORKS

YORK, PA.

Manufacturers of

Circular Rib Knitting Machinery

Cylinders and Dials

go lower. Had we bought yarn at the time you were not buying goods, and had your prediction of a decline come true, we would be in a worse situation than you are by reason of finding yourself short of goods at the prices you expected to pay for them."

Manufacturers in justifying advances which went into effect in the September-October buying period, have explained to buyers that they could not have forseen the advances which they had been forced to make. They had no knowledge of the coal situation, it was pointed out, nor did they know that advances were coming in strawboard, shipping cases and labor. One buyer was reminded that his house for some time had been buying hosiery in case lots, also apparently taking no note of increases in wages and yarn cost. "Now you need goods for filling orders for which we did not provide. It is our policy," a manufacturer said, "to own yarn when we quote prices on hosiery. If you jobbers pursued this policy you would not be finding fault with us because we cannot fill your orders at the price which you thought you might have to pay."

Low prices of cotton hosiery are made in southern mills, it is stated by some of the Philadelphia manufacturers, and it may be significant that William Vernon Sons Co. and the Standard Hosiery Mills, both making cotton goods, have discontinued business, and one other is disposing of its stock and machinery preparatory to doing so.

Publication by a textile periodical of a prediction alleged to have been made by a Philadelphia manufacturer of hosiery that if the present disparity in the wages paid in the knitting mills in the North and those in the South continues, that within five years the manufacturer of cotton hosiery will have become a lost art in Philadelphia, brought out a sharp rejoinder from a mill executive in that city, who denied that it was competition with the South that was forcing these mills to close. He said: "We are practically sold up solid on our high priced and high grade merchandise until July, and are adding considerable machinery to take care of the increased demand. This is done in spite of the fact that some of our southern —so called—competitors are still seeking for business for immediate delivery at considerable lower prices. If the reasons for these retirements, dissolutions and failures were investigated closely there would be 90 per cent of them laid to faulty business methods and, as in the case of all business, the survival of the fittest."

Hosiery of wool and wool and silk in combination has been a big Philadelphia product; in fact there are mills which would feel more comfortable if they had made fewer cases of the better grades of the latter class, for sales have been an all around disappointment and there remains considerable accumulation which should be moved during the current season. There is developing a brisk demand for hosiery of silk-and-wool to retail at $2 a pair and upward but it is stated in department stores that buyers of goods of this value, particularly for Christmas gift purposes, took more kindly to the imported. Some of the larger stores, it is ascertained, entered the winter selling season with tremendous stocks. These they were seeking to get rid of, as much of the holdings was made up of very high priced goods, some of the stockings selling in department stores at $10 a pair. In consequence of the pushing of sales of British hosiery, to the almost total exclusion of domestic, some manufacturers were led to name sacrificial prices. But even though willing to liquidate their stocks without any material return, they found competition with the foreign goods almost out of the question.

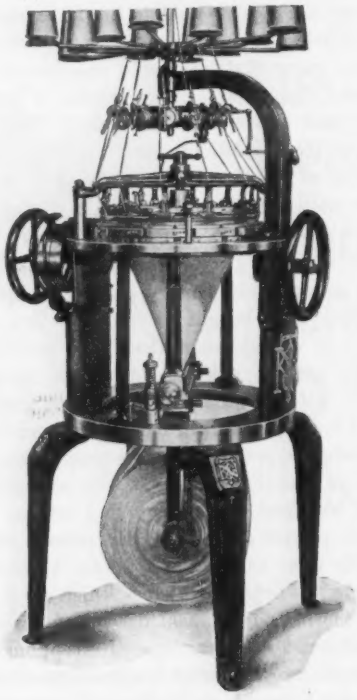
Domestic hosiery in the wool class of course would have moved in better volume had there been prolonged periods of cold weather. The average woman is loath to substitute wool stockings for lighter weights until she feels assured there will be no such climatic changes as might make a return to the gauzy stuff desirable, changes of this kind being regarded dangerous. There should be brisk selling of domestic wool hosiery through January and February unless all weather traditions shall be shattered. Light weight hosiery of wool and silk in combination probably will be worn until the approach of warm weather, and one manufacturer announces he will come out in January with prices for spring.

To some interests silk hosiery has been quite a conundrum. Jobbers have bought so sparingly into next year (leaving out of consideration those who contracted with several mills naming prices which have undergone no change in the last year) that it might be assumed they anticipate even lower prices than have been prevailing. As a matter of fact, silk hosiery for some months has been selling at mills at less than when raw silk was costing them $1 a pound less, and jobbers say that retailer purchases have been in quarter dozens of their various assortments. This probably is no exaggeration, so far as relates to the small retailers. A department store which about the latter end of November bought 1,000 dozens of various shades and sizes referred to the purchase as exceptionally liberal. Considering the magnitude of the business of this store, the lot was only a drop in the bucket. The trade, generally speaking, for some time has been buying drops, while bucketfuls were available. The consequence is, inadequate prices.

Silk hosiery of 260 needles made on spring needle machines for some time has been a big seller, and a few mills, among them one in Philadelphia, have had capacity business and are sold ahead. A good stocking of this class is available to jobbers at $9 to $9.50. Seamless silks made on latch needle machines have not had such a good run and recently some of the mills which had been busy on featured goods were in need of orders.

One difficulty which confronts manufacturers of silk hosiery is that they usually do not know what the consumer, particularly the woman consumer, is going to call for. During the days of lowest temperature in December retailers were selling heavily of very sheer, gauzy stockings, while the demand ought to have been for heavy weights or silk and wool in combination exclusively. But as women will wear furs in summer it may not be surprising that she wants thin stockings for winter, even though the skirt be much abbreviated.

Silk hosiery in hitherto staple lines has felt the effect of the popularity of the stockings with the broad tape seam extending along the back of the leg, this seam making it a matter of no consequence, so far as appearance is concerned, whether the stocking be made on a full fashion machine or otherwise. Probably another factor in the accumulation of silk was the novelty effect in ladies high grade mercerized stockings. Some of the mills making this type of stocking have had a steady run on small orders, their shipments keeping abreast with production, however.



LASTING SATISFACTION

can only be attained by sincere effort to comply promptly and courteously with the request of each customer, by rigorous attention to his individual interests, and by a pursuance of those policies which will establish a reputation for genuine service.

In addition to our machines the quality of which needs no emphasis, it is our pleasure to offer our customers the assurance of satisfaction produced by efficient service.

TRUMP BROS. MACHINE COMPANY

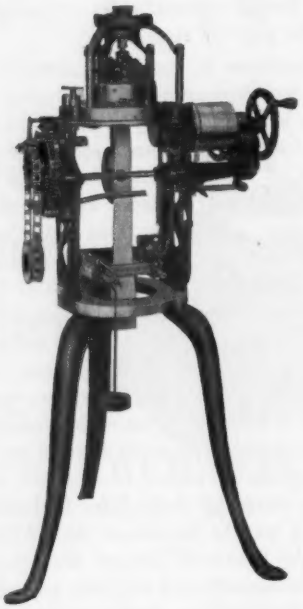
SUCCESSORS TO

NYE & TREDICK CO.

WILMINGTON, DEL. U. S. A.

Cable Address—Trumpbro—Wilmington

Southern Agent—H. F. Booth, Cheraw, S. C.



BRINTON RIBBERS

possess all modern improvements, including selvage welt, French welt, double knee dogless and striping attachments, with automatic stop motions.

Built in all sizes, for all classes of rib work.

We also build hosiery knitters and Body machines for underwear and various other circular machines for all kinds of knitted articles.

Samples and prices on request.

H. BRINTON COMPANY

Kensington Ave. & "M" Street

Philadelphia Pennsylvania

A jobber in the West recently wired an order for one case to be shipped by express. In the same week he wired another order, for three cases, also to go out by express. There are enough instances of this character to show that jobber stocks must be down to the boards, and that they had practically nothing to carry in the year-end inventory.

Heather hosiery of wool and cotton in combination and heathers of all cotton retain their grip on the public, and, in addition to selling freely for the current season, are being bought for the winter of 1923-24. One establishment shows orders aggregating approximately 20,000 dozens, which in the circumstances is considered very fair advance buying.

Jobbers have said that in their purchases of cotton underwear they are not influenced by the ups and downs in cotton; that they buy early or late depending upon the attitude of retailers. This would seem to be contradicted by the enormity of the business placed during September for the next heavyweight season, and the comparative stability of cotton had a great deal to do with it, for it removed to a very large extent doubts as to values for at least the early months of 1923.

The government estimate of a 9,964,000 bale cotton crop was viewed as confirming what had been discounted, leaving no cause for elation in bear quarters, and the bulls were not pawing the earth. It was noted that following the issuance of this report buyers were less disposed to question the justification of manufacturers' prices, and the report of November cotton consumption gave additional stimulus to the market.

It was sometime before some of the northern heavyweight mills screwed up enough courage to come out with prices for next fall, and a few deferred doing so until after the middle of the month. Meanwhile the Appalachian and Standard mills and the P. H. Hanes Knitting Company had booked more business for deliveries during the first six months of 1923 than had been taken by either in the corresponding period in the last two years. The openings of cotton ribbed lines and fleeces as well were badly scattered. However, jobbers who bought obtained goods at undoubtedly the lowest prices that will be heard for the next fall and winter season. There is still some buying by jobbers for the current season, and it is likely some of the goods bought for deliveries in January ostensibly for the coming winter will go into distribution at once. Numbers of buyers tell of corners which are absolutely bare. They can buy underwear for right away shipment, they say, but frequently not the numbers which they have been carrying. The scarcity predicted by manufacturers is making itself felt. Daily, it is stated by the sales department of one large mill, orders for January shipments are declined, the mill having all it can do in taking care of orders previously booked.

There will be no underwear famine, however, but as mill stocks approach depletion, it is to be expected manufacturers will take advantage of an opportunity for obtaining prices which were denied them when distributors were waiting for what did not transpire—a drop in cotton.

Not in three years have mills been more busily engaged in the manufacture of underwear on order than at this time. This view is supported in the yarn trade, the observation of sellers all pointing to a very general preparation for an active market during the first half of next year. Jobbers were buying in spite of a published interview in which one of the larger New York primary market operators was quoted as saying there was no justification for the rise in price; that there was no scarcity or prospect of a scarcity of raw materials, and that buying at higher levels for delivery a year later was, in effect, nothing but pure, outright gambling. If this jobber is operating as he talked he is likely to pay the penalty for his error of judgment in advances as sharp as those which already have gone into effect.

In comparison with a year ago, heavyweight underwear may be said to be from ten to fifteen per cent higher. However, a sixteen pound union suit for the coming winter should not cost the consumer over 20 cents more than he paid for the garment he is wearing this season. Fleeced underwear is priced $12.50 a dozen for nineteen pound suits, which is an advance of $1 over a year ago, when, on the basis of 10s single, carded, yarns were quoted at 10 cents under current prices actually obtained. Thus, in a 19 pound garment there has been an increased yarn cost, on the theory that values are represented by replacement, of $1.90 a dozen. The manufacturer has added but $1. One mill substituted a sixteen pound fleeced union suit for an eighteen pound and marked the price 50 cents higher. This was an expedient for trying to adapt prices to buyers' notions as to what they ought to be.

Buyers' satisfaction with the prices of the various lines of underwear produced by one large mill is indicated by the fact that those who usually buy early and did so this year increased their orders by 20 to 40 per cent over their initial purchases a year ago. At the end of three weeks after the formal opening, the mill had booked almost two million dollars worth of business and had but scratched the surface. This mill also is receiving many small quantity rush delivery duplicate orders, and is booking additional business in light weights.

Mens' light weight underwear under contract for the coming season was bought advantageously, but there remains considerable buying to be done. There is in prospect a scarcity of men's bal briggans, and already there is a scramble for desired deliveries. Several mills have declined orders calling for shipments in January and February. Prices have moved up 50 cents a dozen on shirts and drawers since the opening and buyers offer not the slightest resistance. The sales manager of a New York State mill says his establishment could, if it were in position to fill orders, sell 5,000 cases of men's bals. Retailers have bought considerable stuff for spring, according to a number of jobbers, and it is believed the demand for more goods for the light weight season grows out of the hearty response of the retail trade earlier than had been contemplated. The heavy sales of knitted lightweight underwear for men are the more remarkable from the fact jobbers and retailers have bought very extensively of nainsook athletic suits.

Summing up the underwear situation, it may be said that not since 1919 has the situation been so promising; that mills are assured of steady operation during the first half of the year, and that the outlook for 1923 from the viewpoint of manufacturer, jobber, and retailer is most encouraging for interests which discount immediate effect

ABERFOYLE MANUFACTURING COMPANY

MERCERIZED YARNS

MAIN OFFICE
EMPIRE BUILDING
PHILADELPHIA

ADAMS-FRANKLIN BUILDING
CHICAGO

MILLS
CHESTER, PA.

WESTAWAY BUILDING
HAMILTON, CANADA

of disturbing reports of the foreign situation and prophesies of radical legislation at home, nevertheless approaching the crossing under control, with an eye to windward for danger signals.

The heavy weight sweater season had a somewhat inauspicious opening. Worsted yarns were commanding prices based on wool at approximately the peak for the year, and buyers were hesitant to operate. Some bought yarns; others did not, and a few said they would make no commitments until jobbers had indicated their intentions as to sweaters. A few mills with yarns bought advantageously some months ago, apparently, and other mills owning no yarns, but taking a gambler's chance, named prices under those of several manufacturers quoting down to dangerously near actual cost. These figures necessarily deterred buyers from operating among mills adhering to legitimate practices, and business was sadly disappointing. Mills selling short of yarns never will deliver the goods unless yarn recedes materially, it is conceded in the trade, and later there should develop a fairly strong situation for manufacturers with patience to carry them through the period of doubt, which in relation to sweaters may be a protracted one in view of fear of a buyers' strike aimed at prices of practically all wool goods.

Knit Goods Show in April.

Actual arrangements for the 19th Annual Knitting Arts Exhibition, to be held in Commercial Museum, Philadelphia, during the week of April 2 to 6, 1923, are now well under way, announces Chester I. Campbell, all preliminary details haveing been consumated. Mr. Campbell, who conducted the Exhibition in 1922, will also have personal direction of the Show this year.

As is known, the Exhibition will be under the National Association of Hosiery & Underwear Manufacturers, and will be attended by knit goods manufacturers from all parts of the country. As is the usual custom, the annual convention of the National Association will be held during Show Week, and there is every reason to predict that the occasion will be a busy one for Philadelphia.

Already a large part of the floor space of the museum building has been reserved by exhibitors, and the list of firms which will display their machinery and products will include the leaders of many lines allied to the knitting industry. Up to this writing the number of spaces taken has passed the 225 mark. This exhibition will include, in addition to a more comprehensive display of knitting machinery and appliances than has ever been shown before in this country, exhibits by yarn and raw material firms, dyers finishers, supply manufacturers, as well as a long list of concerns whose products are used in the industry, As usual, much of the equipment on display will be in actual operation, and as there has been considerable development during the past year great interest will be shown in these features, which are of great educational importance. The successful manner in which the Show last year was directed by Mr. Campbell and his associates will be remembered.

Many a man thinks he is patient, when, in reality, he is only indifferent.

The Year in Knit Goods

Beyond the clouds there is always sunshine.

This absolute fact has never before been as forcibly demonstrated in any of the business marts as it has been in the underwear and hosiery industry during the year 1922. And it is evident that there are heaps and heaps of reserve sunlight scheduled to appear for the manufacturer during the year 1923.

It is a well known fact throughout the industry that the year 1922 began miserably. There were so many obstacles in the path of the manufacturer that it was evident, even at the first period of the year, that many mills would be forced to close down before Christmas if conditions remained constant.

A number of mills did curtail production. Many of them were forced to close the doors during the period when pessimists were insisting the country was going to the bow-wows. But it is interesting to note that the majority of these mills are now running full blast, employing more workers than ever before, and with orders enough filed away to keep the wheels turning merrily for many months to come.

The well known "hand to mouth" buying was evident for the first several months of 1922. This and this alone was responsible for what has been called the slump in the knit goods market. Manufacturers of knit underwear and hosiery found that it was practically impossible to keep on working and piling up immense surplus stocks. It may be mentioned in passing however, that there were a few mills which kept right on "tending to their knitting," the owners of which are now sitting back figuring just how much income tax they are to pay. And in this figuring they are finding it necessary to call in expert accountants, for to make a long story short, they cashed in at a tremendous rate.

On the other hand manufacturers who went slow, curtailed production and closed down several days a week, have been and are still rushing around in circles trying to fill rush orders which are pouring in hourly.

The law of average works in the manufacturing game as well as in any other.

A natural shortage of hosiery and underwear was bound to occur, and occur it did, and when it came there were few surplus stocks.

Jobbers discovered along about August that the hand to mouth period had served its usefulness. Their retailer customers were demanding immediate shipment. Long distance telephones into the manufacturing centers were worked overtime. The jobbers were confident they could get underwear and hosiery for immediate shipment—they felt that the poor starved manufacturer would jump at the chance to make an honest dollar after such a period of non-activity.

The manufacturers jumped all right. They are still jumping, and will continue to jump for a number of months before production increases sufficiently to supply a demand which has been more or less neglected because of their hand to mouth period.

All of which makes the assertion, that the underwear and hosiery industry right now is in wonderful shape, an actual fact. And it seems evident that the year 1923 is going to be one of the best the industry has ever had.

As the season for heavy weight underwear for 1922 drew to a close, mills in all sections were reporting an increased demand. In many cases the orders called for almost over-night shipment and as spot stocks in the mills were still low, many of these orders had to be declined. Even in cases in which the buyer was willing to accept shipment within two or three weeks, refusals of orders were numerous, as many manufacturers had already sold all they could deliver during the balance of the year and for several months of 1923.

Prices for heavy weight lines for 1923 were named by some mills in December, but the majority of manufacturers hesitated to open their lines at that time because they believed that if they announced figures based on the then present yarn prices their quotations would be so high as to discourage business. Of the mills that named prices the majority specified deliveries only during January, February and March, and the price advance in these cases was between 5 and 10 per cent. Any buyer who purchased on this basis would, perforce, have to carry the stock for some months.

There have been recent offerings, however, for more distant delivery, but such prices have been on a sliding scale. This arrangement provided for a comparatively small advance over December prices for delivery during the first quarter of 1923, an additional advance for delivery during the second quarter, and a still further increase for shipment in the third quarter. The volume of orders booked by any of the firms for heavy goods for 1923 is difficult to determine, reports varying considerably. It seems almost certain, however, that no very important quantities have been contracted for.

Following the opening of spring underwear last August, at which time a considerable proportion of the total business was placed, a period of dullness ensued which lasted for almost two months. Since then, however, a decided increase in activity has occurred.

Salesmen on the road on their second trip reported that many buyers, who previously had refused to place orders, were then purchasing, and mills reported that they had far more business booked for spring than at the corresponding time in 1921. In fact, business taken in the late fall of 1922 may be said to have been satisfactory. Prices were holding firm and in a number of cases were showing slight advances.

Every phase of the knit goods industry points to a period of unusual activity. Not in many years have demand and supply been as evenly balanced as they are at the present time. Higher prices throughout the year are expected, and the public is expected to pay them without question.

Cotton ribbed union suits, 16 pound, were selling at $11.25 a dozen for the first three months of 1923. A 13 pound suit was sold for deliveries to April 1st at $8.50. It is obvious that manufacturers must keep the price up due to the fact that no drop in yarn prices is even looked for.

Few jobbers went into 1923 business with any winter underwear carried over from last season. This was made apparent in recent sparse buying—in lots of one to several cases usually for delivery by express. Underwear looked better to jobbers as a future shipment than as an item in the December inventory. It was stated that in the process of stock reduction several jobbers rather than fill in assortments of low priced goods, substituted with garments of higher value. Also, the average jobber appeared less disturbed over the record prices for wool underwear than over the cotton situation.

The movement in cotton in the late months served to revive interest in summer underwear. It is estimated in the trade that certainly not more than 60 to 65 per cent of normal requirements has been contracted for. Until recently it was stated by several prominent Pennsylvania manufacturers of women's vests and pants that buyers were placing no business when higher than the opening prices were asked, and it is known that several mills requested deferred deliveries of cotton yarns. That business with this class of mills generally was not pressing was indicated by the fact that one was operating but one-fifth of its equipment, although owning enough yarn to carry it through March with all machinery in operation. The mill simply was completing orders as they came in.

Summer underwear, using double carded 30s yarn based prices for the recent season on yarn at 41 to 43 cents. When it reached 46 cents, mills declared they could not get enough out of the goods to warrant them paying such a figure. And while they were waiting for lower yarn prices or higher prices for their production, yarn took another jump up to 50 cents and left the mills worse off than before.

Considerable underwear remains to be bought, and incidentily the mills have to step lively to keep abreast of the orders which are expected to increase with the coming of the new year.

Winter underwear business was expected to dwindle down close to zero about the first of December, but its failure to do this has been another surprising feature of the market.

Quite a number of New York selling agents said that their mills are still receiving telephone calls and letters ordering heavy weight underwear to be shipped immediately, and at the same time were receiving cancellations on orders placed two or three weeks before for immediate delivery which the mills have fallen behind on. This would indicate an even greater shortage of heavy weight merchandise than was generally estimated, also that jobbers are making frantic efforts to obtain goods to meet the demands of their retail customers. One jobber stated that he had sent a fair sized order for heavy weights to one mill for immediate delivery and then sent precisely the same order to two other mills, hoping to obtain merchandise from at least one of them. Asked what he would do if all three mills shipped the goods, he claimed that he would be lucky if he got them from one, and in the event of all three shipping he said he knew other jobbers who would be glad to take the merchandise off his hands.

In line with this splendid response to the openings of fall, 1923 lines by the jobbing trade, prominent retailers were also in the market for this class of merchandise. The buyer for a well known New York department store claimed that he would purchase his fall, 1923 merchandise during December, while the buyer for a big Philadelphia store who purchased his fall, 1922 goods in July of that year, had already placed his order for fall, 1923 by the middle of December. Orders from retailers specified deliveries ranging from August 1 to November 1, 1923, and manufacturers who have taken these orders are mostly trying to get the retailers to take earlier deliveries.

This activity of jobbers and large retailers in fall 1923 merchandise reflects a healthy market tone and must indicate confidence on the part of buyers that prices for 1923 will be maintained at prevailing levels or better.

The Christmas holiday season usually finds the selling offices cluttered up with traveling salesmen in off the road whiling away time until January rolls around. But last month salesmen who went out in September were still on the road and what is more were continuing to do business in all lines. Taking it by and large the knit underwear trade closed the year 1922 with a burst of speed, the like of which the industry has not enjoyed for many seasons.

The last six weeks of the year the underwear market witnessed a complete turn about face on the part of both buyers and sellers. Into the middle of November it was more or less a buyer's market with a corresponding timidity on the part of sellers to boost prices commensurate with the increased price of raw materials. Today the situation is different. The manufacturer is now in the saddle and providing he does not let the situation run away with him, he will remain there for some months to come. Merchandise can be sold today at a profit and a manufacturer who lets go of his merchandise without getting a fair profit for it has failed to diagnose the market and had better wake up before some smart buyer steals his stuff.

While fleece lined goods are not generally open, those selling agents who have been showing their lines claim to be booking satisfactory business at price advances averaging ten per cent. Late fall increases in prices of woolen and worsted lines were of such proportion that the response was none too good when the lines were opened, but better interest was reported as having been in evidence during mid-December. Compared with cotton goods, the increases in woolen and worsted prices distort the buyer's point of view as to what they should be, the buyer for the time being failing to realize that while pennies can be applied to cotton goods it is necessary to think in terms of nickels and dimes when considering woolens and worsteds in conparison.

The hosiery business throughout the year has been more or less unsatisfactory. Beginning at the source of supply, the manufacturer's position, to say the least, has been an undesirable one. Having only partially recovered from the drastic liquidation of the preceding year, he was confronted at the beginning of 1922 with impaired business prospects. His business was anemic with little money and, as a rule, big stocks, the value of which was influenced downward by the pressing need of money, creating a maze of conflicting and confusing valuations for prospective buyers. Buyers lost confidence in the many quotations and bought their needs only.

German hosiery, which had been bought the year before, began arriving on these shores at prices which were absurd and menacing when compared with American costs, creating a false impression upon many American buyers

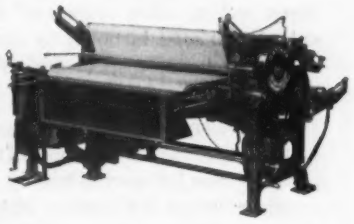
AMERICAN FINISHING MACHINES *for* KNIT GOODS TRADE

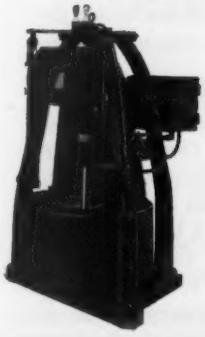
The garment that gets the choice

Given two garments of the same price, one finished and the other unfinished, the customer always chooses the better looking. You can easily give your underwear this extra sales point with this American Underwear Finishing Press.

The improved hosiery finisher

With the American Rotary Hosiery Press there are no press boards to replace. It requires small floor space, yet is capable of large production. It imparts a superior finish that helps swell sales.



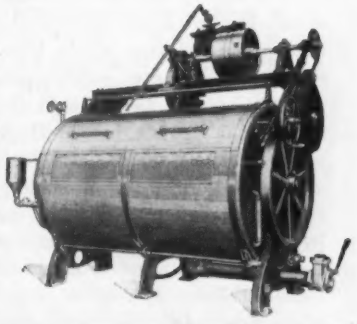


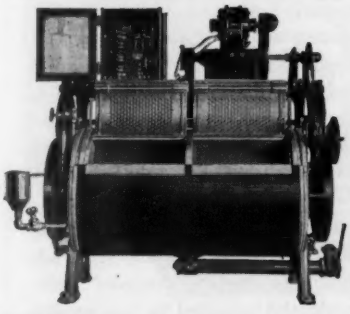
A better extractor for the dye-house

The American "Humatic" Extractor is absolutely fool proof, its automatic timing feature permits each load to run the same length of time. It is fitted with an automatic signalling device. The motor is attached directly to the spindle.

Uniform results at an economical cost

The Acme Dyeing Machine wins universal approval with the uniform results it produces at an economical cost. It is sturdily built—it will last many years.



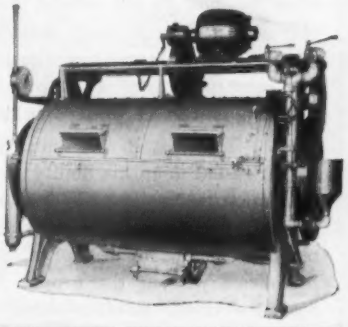


A lasting machine that gives lasting satisfaction

The chemical action of the dyes can't effect this Monel Dyeing Machine. It will last a lifetime and give real satisfaction, uniform dyeing and large production all the way. It pays for itself with what it saves.

For light shade dyeing

You'll find no better machine for dyeing light shades than the Cascade. Perfect also for boil off, also for all washing operations.



The American Laundry Machinery Company

Specialty Department C., Norwood Station, Cincinnati, Ohio

Canadian Factory,
The Canadian Laundry Machinery Co., Ltd.
47-49 Sterling Road,
Toronto, Ontario, Canada.

British Sales Agency,
American Laundry Machinery Co., Ltd.,
36-38 Victoria Street,
London, S. W.-1 England.

Send the attached coupon for full information

Fill out and mail the attached coupon today, and full information will be sent you by return mail.

The American Laundry Machinery Co.,
Specialty Department C,
Norwood Station, Cincinnati, Ohio.
Please mail me full information covering the "American" Line for Textile Manufacturers.

Signed .....

Business Address .....

City ..... State.....

that a new bonanza was open to them; a land of magic and miracles was operating to supply their every need, and, as a consequence, they showed little interest in similar American products.

The coal and railroad strikes became an actuality and the business of the jobber was at a standstill. All other relative industries were affected and approached a period of stagnation.

Self-preservation, the first law of nature, became the paramount thought in many manufacturing minds and such began seeking other sources of distribution. Stocks were unloaded in some instances to retailers at prices below that of manufacturing costs creating further distress to the jobber and making their task all the harder.

The general depression influenced other industries and knitters approached a period of general inactivity. Then a new scheme for moving hosiery from the producers to the consumer swept the country and met with partial success at the beginning, due to methods of selling which were unique.

Silk hosiery was sold by house to house canvassers with a nail file and knife demonstration, a test which any ordinary silk stocking would have stood demonstrated the same way. The ever gullible public, convinced by the demonstration and the thought that they were saving the middle man's profit, bought freely, taking away from the usual channels of business, a percentage of no small amount. However, the promoters profit, plus the canvasser's commission proved to be more than the profit taken by the middle man. When the public finally learned that they could buy, in some cases, the same goods from their local distributor at a figure as low, if not lower than those of the presumably circulating philanthropists, direct selling from the mill to the retailer became more prevalent but only successfully so with concerns who had the financial means to equip larger organizations. The success of these few concerns created an impression to the smaller manufacturer that direct selling was the panacea of his ills.

The feasibility of his selling direct, however, upon analysis, rested upon his ability to equip and finance an organization to handle 209,500 retailers against 3,175 wholesalers, a proportion of seventy to one. The absurdity of a manufacturer of small capital and small organization selling direct without the proper finances and organization, became obvious. In other words, the impossibility of carrying a load which had been distributed on many shoulders, became evident and those who experimented along these lines, improperly equipped, soon found that they could not carry the burden. Expensive advertising campaigns, the financing and organization necessary for success resulted in many abandoning the thought. The fact remains, however, that this partial transition represented a loss to the jobbing channels of many thousands of dollars.

The present finds normal conditions among hosiery mills generally prevailing, with cotton holding steadier than silk or wool. Some of the southern mills are well supplied with orders and the prospects for the near future seems bright indeed. What will happen later in the year will depend very largely on the raw cotton situation and any definite prognostication on that subject at this time would have to be merely the wildest sort of a guess.

As usual, it will be the manufacturer who is most adept at reading the future from the cards, who will, in the end, make the largest winning.

New Models for Cotton Warehouses.

(*Continued from page* 192.)

floors and for the roof are used. Splining of this planking insures a closed joint, prevents the ready passage of flames, retards leakage of water, and tends to prevent warping. Non-combustible roofing that will resist the lifting or sucking action of the wind is used, tar and gravel roofing being preferable to tin or sheet iron.

A modified type of slow-burning construction in general and satisfactory use is like that already described, except that the exterior walls are of light frame and the fire walls modified to form an effective fire break. This is known as wood-end construction. It is inexpensive and suitable where real estate values are low and a one-story building can be spread over a wide area. But it should be used only where the outside fire hazard is remote. Clay wall tile may be used instead of the frame walls. The light frame walls may be readily pulled off in case of fire, which provides openings for the hose and makes it possible to rescue the cotton.

The foregoing in general describes the Department's new models, but there is considerable detail which prospective builders of warehouses may secure from the Department direct. Each project requires individual study and it is pointed out by the Department that the design and construction of a cotton warehouse should be handled by a competent engineer having a thorough understanding of construction, fire protection, insurance requirements and rates, together with some knowledge of warehouse management.

A well-constructed, properly managed warehouse not only enjoys a low fire insurance rate, which makes possible a comparatively lower warehousing charge, but is readily granted a license under the United States Warehouse Act. The receipts for cotton stored in such warehouses are accepted as collateral in making bank loans. This in turn enables the owner of the cotton to market his product when market conditions are favorable.

During the past few years there has been a gratifying appreciation on the part of cotton producers and the trade generally of the economy of constructing fireproof warehouses. The trend is abundantly indicated in the records of warehouses licensed under the Warehouse Act. From the date of the passage of the Act in 1916 up to April 1, 1920, only 23 cotton warehouses of a combined capacity of 40,050 bales were licensed. But one year later, on April 1, 1921, the records showed 238 licensed cotton warehouses of a combined capacity of 429,975 bales.

It is becoming generally recognized that warehouse fires are an irreparable financial and economic loss no matter how well the buildings and contents may be insured. An increasing number of fireproof warehouses are being built. There is great need for more of them.

Initiative is doing the right thing without being told. Ability is doing the right thing when told once.

Perhaps the surest things in life are the expenses we hadn't counted on.

SANDOZ

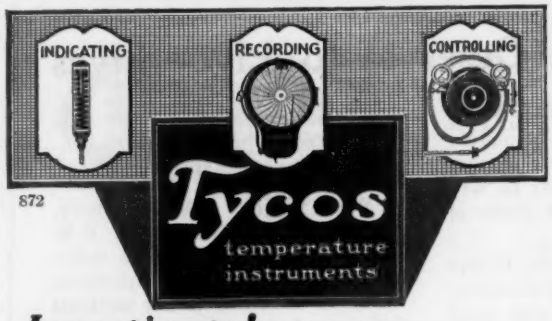
ANILINE DYES FOR ALL TRADES

We carry a complete line at all Branches.

For samples and prices apply at any of our offices.

SANDOZ CHEMICAL WORKS
INCORPORATED

238-240 Water St. NEW YORK
12 So. Front St. PHILADELPHIA
175 Market St. PATERSON
36 Purchase St. BOSTON
Commercial Bank Bldg. CHARLOTTE, N. C.



Investigate!

any number of *Tycos* installations. You will find that each manufacturer has full confidence in each *Tycos* Temperature Instrument in their plant. Confidence that is the result of *Tycos* consistent accuracy and ruggedness.

Operators in the textile fields are invited to send for our cloth bound General Industrial Catalog. A ready reference book.

There's a Tycos or Taylor Temperature Instrument for Every Purpose.

Taylor Instrument Companies

ROCHESTER, N. Y., U. S. A.
Canadian Plant, Tycos Building, Toronto

AUTO GYP
Process of Dyeing

Profit Producer--

By effecting unusual savings and producing desired results—AUTOGYP has made itself known in mills, bleacheries and finishing plants all over the country. AUTOGYP is the patented process of simultaneously bleaching and dyeing to the desired shade, eliminating specks, motes, leaf and shives, in one operation **of three hours time.**

The use of AUTOGYP does not require any additional equipment, nor does it entail any unnecessary expense. AUTOGYP can be profitably and satisfactorily used, with your own equipment, under your own conditions, producing a much better finished fabric with a softer "feel."

AUTOGYP can be made to produce profits for you in your dyeing operation. Cite for instance the great savings effected by the use of AUTOGYP. It saves boiling out in kiers; saves the disagreeable bleach, with its attendant danger of weakening fibre; saves 4 to 17 hours time, performing the complete operation to shade in 3 hours time; saves 6 separate steps and operations; 3½% of shrinkage; 25% of steam; 20% of labor; 90% of water and ALL CHEMICALS used in the chloride of lime method of bleaching.

We want **you** to take advantage of AUTOGYP. Our staff of experts and our fully equipped laboratory are at your service and disposal.

You will incur no obligation by writing us for fuller information.

Let's get together for mutual profits and a better product.

Surpass Chemical Co.
Albany, N. Y.

SURPASS CHEMICAL CO. AUTOGYP ALBANY N.Y.

Sulphurous Acid Generator

Practically Indestructible

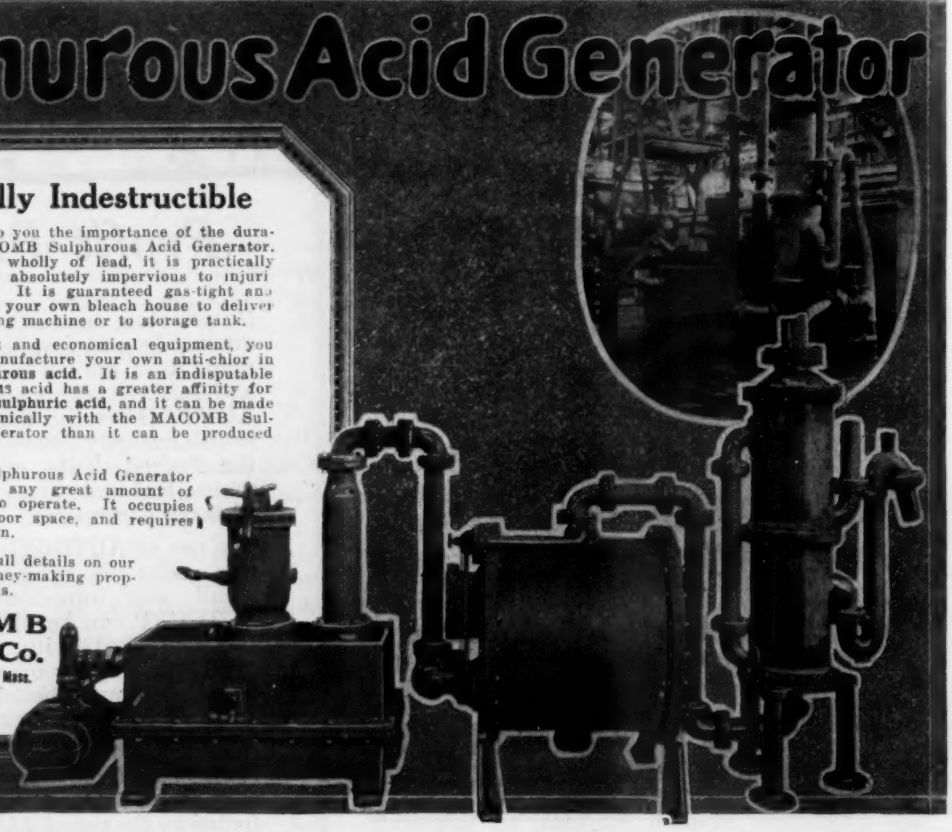
We want to cite to you the importance of the durability of the MACOMB Sulphurous Acid Generator. Being constructed wholly of lead, it is practically indestructible, and absolutely impervious to injurious acid reaction. It is guaranteed gas-tight and can be installed in your own bleach house to deliver direct to the souring machine or to storage tank.

With this efficient and economical equipment, you are enabled to manufacture your own anti-chlor in the form of **sulphurous acid.** It is an indisputable fact that **sulphurous** acid has a greater affinity for chlorine than has **sulphuric acid,** and it can be made much more economically with the MACOMB Sulphurous Acid Generator than it can be produced elsewhere.

The MACOMB Sulphurous Acid Generator does not require any great amount of space or power to operate. It occupies only 36 sq. ft. floor space, and requires 2 h.p. for operation.

Let us send you full details on our money-saving, money-making proposition. Write us.

MACOMB Machine Co.
230 Newton St., Waltham, Mass.



K-W

"The World's Best Dyeing, Bleaching and Scouring Machinery—

That Which Deserves to Live---Lives

Whether it be a man or a manufacturer, if his product be merely mediocre, he will be left alone—if he achieves superiority he will become a target for the shafts of the envious few.

But that which deserves to live—lives. The fact that Klauder-Weldon Machinery is still good after over a half-century's use in scores of mills is proof that it lives—has deserved to live. The fact that this same machinery, after the long ravages of live steam, heat and alkalis is still more efficient and economical than any other modern machinery of its kind, is one reason why we can say, without boasting, that it is "The World's Best Dyeing, Bleaching and Scouring Machinery."

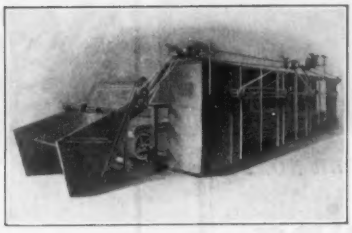
When you buy K-W Machinery, you MUST be satisfied, for K-W reputation must always be maintained. Our years of experience and the efficiency of our methods of manufacture guarantee economy in first cost, and economy throughout a long life of efficient service under the severest usage.

Our engineers are at your service, and will be glad to offer suggestions toward solving any finishing problem in your mill, without obligating you.

Write today for literature.

The Klauder-Weldon Dyeing Machine Co.
BETHAYRES, PA., U. S. A.
H. G. Mayer, Southern Agent, Realty Bldg., Charlotte, N. C.

"HURRICANE"



AUTOMATIC STOCK DRYER

REDUCE DRYING COSTS

With a "Hurricane" Automatic Stock Dryer

These machines, in many of the leading textile plants in this country and abroad, are saving steam, labor and floor space for their owners. They are producing evenly, thoroughly dried fibers, with which it is possible to produce the best of finished material.

May we describe this process to you more fully?

A "Hurricane" Dryer for every textile need.

The Philadelphia Drying Machinery Co.

Office and works: 3351 Stokely St. **Philadelphia, Pa.** Boston Agency: 53 State St.

---

ciba Co. Inc.
BOSTON BRANCHES PROVIDENCE
PHILADELPHIA
COLUMBUS.GA.
CEDAR and WASHINGTON STS.
NEW YORK

Fast Developed Colors

for Silks and Cottons

Exceedingly fast for washing and cross dyeing.

ROSANTHRENES

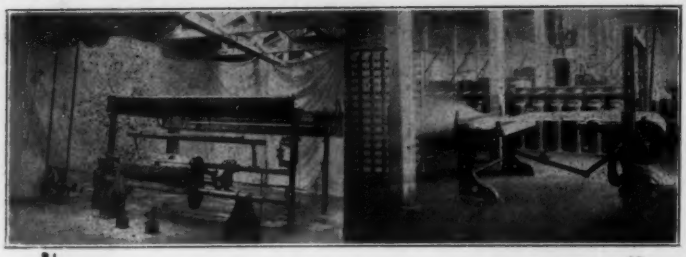
Yellows — Oranges — Reds — Bordeaux

INDIGENE

Blues and Blacks

Sole Representatives in the United States for the **Society of Chemical Industry** in Basle, Switzerland

Sole Selling Agents for Dow's Indigo and Midland Vat Blues



WARPER NO. 1 *WARPER NO. 2*

Special Beaming Warpers

We are illustrating above Special Beaming Warpers number One and number Two. Both of these machines are designed and built TO WARP FROM EITHER TUBE OR SPOOL DIRECT TO THE LOOM BEAM WHERE IT IS UNNECESSARY TO SIZE THE YARN.

Warper number One is designed to take care of any number of ends up to three thousand, with the Creels (not shown in illustration) arranged in from four to six wings.

Warper number Two is designed to take care of any number of ends up to one thousand, with Creels arranged in two wings.

Both machines are equipped with an efficient Tension Device and Beam Compressor for securing a hard even beam, also with simple and efficient leasing devices and expansion combs to suit varying loom beam widths.

An Electrical Stop Motion in the Creels, for stopping for broken ends, and an efficient Automatic Measuring Clock for stopping the machine at a given length is also furnished as a part of these requirements.

For further particulars write or wire.

Cocker Machine & Foundry Co.
Gastonia, North Carolina

Specialists in Designing and Manufacturing Machinery for Making and Handling of Warps

DESIGNERS AND BUILDERS OF Warping Machinery

Linking Warpers — Balling Warpers — Beaming Warpers.

Warp Dyeing Machinery

Boiling Boxes—Continuous Systems—Sizing Machines—Indigo Vats—Warp Coilers—Dye House Ballers—Wash Boxes—Sulphur Vats—Scotch Systems.

Warp Beaming Machinery

Long Chain Beamers—Short Chain Beamers—Warp Splitters.

"Proctor" DRYERS
The best dryers in the world for TEXTILES

AUTOMATIC RAW STOCK DRYERS
TRUCK AND AUTOMATIC SKEIN YARN DRYERS
PACKAGE YARN DRYERS
TENTER HOUSING AND AIR RECIRCULATION
HOSIERY DRYERS

We build Drying Machinery for all Textile Materials. Write for catalogues.

PROCTOR & SCHWARTZ, INC.

formerly The Philadelphia Textile Mach'y Co. and Smith & Furbush Machine Co.

PHILADELPHIA, PA.

FILTERS

PRESSURE GRAVITY

Especially designed to meet all requirements of Textile Mills.

Economical in upkeep.

Perfect satisfaction.

NORWOOD ENGINEERING CO.

Florence Mass., U. S. A.

CHAS. M. SETZER, Southern Representative,

Charlotte, N. C.

The Grasselli CHEMICAL CO.

CHEMICALS ZINC GRASSELLI EXPLOSIVES DYESTUFFS

Dyestuff Dept 117 Hudson St. New York, N.Y.

KATIGEN DEEP BLACK GGN CONC.

The Ideal Sulphur Black for Hosiery

The Grasselli line of sulphur colors offers a wide range of products suitable for raw stock, machine or piece dyeing.

Through the use of these colors practically all shades possible of production by the sulphur group may be obtained.

We also offer a full line of Algol and Developed Colors manufactured by

FARBENFABRIKEN VORM. FRIED. BAYER & CO.
Leverkusen

Shades matched and quotations furnished promptly.

Factories at
Rensselaer, N. Y.
Grasselli, N. J.

Branch Offices
Boston Providence
Philadelphia Chicago
Charlotte New Orleans
San Francisco

THE GRASSELLI CHEMICAL CO., LTD.
TORONTO MONTREAL
CANADA

Sole Selling Agents
ESSEX ANILINE WORKS, INC.
Boston, Mass.

Established 1815

ARNOLD, HOFFMAN & CO., Inc.

Providence New York Boston Philadelphia Charlotte

All Kinds of
HEAVY CHEMICALS
Sole Agents for
BELLE ALKALI CO.
of Belle, W. Va.
Manufacturers of
LIQUID CHLORINE
BLEACHING POWDER
CAUSTIC SODA
Solid and Flaked

We solicit your inquiry for prompt or future delivery

Rohm & Haas Company

Manufacturers of

CHEMICALS

BRISTOL, PA. PHILADELPHIA, PA.

Specialties

LYKOPON — Concentrated Hydrosulphite for reducing Indigo and vat dyes.

FORMOPON—For discharge work.

FORMOPON EXTRA — For Stripping.

INDOPON W—Indigo Discharge Assistant.

TARTAR EMETIC—Technical.

Represented by

The MAKENWORTH COMPANY

Greensboro, North Carolina

Chas. Lennig & Company

Incorporated

40 North Front Street Philadelphia, Pa.

Works: Bridesburg, Philadelphia, Pa.

Manufacturers of

Concentrated Sodium Sulphide

Crystal Sodium Sulphide

Also manufacturers of the following chemicals:

ALUM	GLAUBER SALT
SULPHATE OF ALUMINA—	OIL OF VITRIOL
Iron Free	NITRIC ACID
PAPER MAKERS' ALUM	MURIATIC ACID
WATER FILTRATION ALUM	NITRATE OF LEAD

Represented by

The MAKENWORTH COMPANY

Greensboro, North Carolina

VICTOR MILL STARCH

The Weaver's Friend

It boils thin—it penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

THE KEEVER STARCH COMPANY, Columbus, Ohio

Southern Agent: MR. JAMES H. MAXWELL, Greenville, S. C.

If you are not already using VICTOR STARCH call on our representative for a demonstration at your convenience.

REVEALING EYES

Just as the 16" gun is but an extension of the mailed fist, so the microscope and camera are an extension of the human eye.

When the microscope and camera are turned upon wool, cotton, yarns and cloth, they clearly reveal the reason of the beneficial results obtained from the use of the special purpose alkalies

Wyandotte Textile Soda
Wyandotte Concentrated Ash
Wyandotte Kier Boiling Special

Brighter color, softer texture and finer loftiness is then explained by the splendid condition of the fibres.

Moreover, by obtaining these desirable results without adding to the cost of production, the economy of these alkalies is clearly demonstrated.

Ask your supply man.

The J. B. FORD CO., Sole Mnfrs.
WYANDOTTE, MICH.

"BRETON"
MINEROL "F"

For

Cotton Piece Goods

"The goods have a finer face"

BORNE, SCRYMSER CO.
Established 1874
80 South Street, NEW YORK
BOSTON **PHILADELPHIA**
Works: Elizabethport, N. J.

Better Service for You—An Announcement

When the Electric Smelting & Aluminum Company, Inc., first began the manufacture of detergents, the production and marketing of them was easily handled by the same organization that was doing like service in the Company's other field, the smelting and alloying of non-ferrous metals. Today the distribution and servicing of the products first mentioned, i. e.:

ALUMINA SOAPALITE, ESCO MINERAL CLEANER, ESCOLITE, ESCOLITE MINERAL CLEANER, SOL-ESCO, ESCOLITE ALUMINUM CLEANER, AND OTHERS,

Requires a large organization of trained specialists. We feel this will best serve our customers' interests by functioning as a unit separate and distinct from the manufacturing Company. To that end, there has been organized and incorporated—

THE OWLES DETERGENT CO.

which, beginning January 1st, 1923, will, under arrangement with The Electric Smelting & Aluminum Company, Inc., manufacturers, undertake the distribution and service to customers of the products mentioned.

The same salesmen who now represent the above products continue in that capacity with the new company.

THE ELECTRIC SMELTING & ALUMINUM CO., Inc.
Factory and Sales Office, Lockport, N. Y.
Send for Sol-Esco Booklet on Facts You Should Know About Kier Boiling

Superior Quality—
Prompt Service—
Right Prices—

Roller, Clearer and Slasher Cloths

Our Roller Cloths are made of the right material with exactly the correct cushion and uniformity of surface to produce the most desirable results.
Clearer Cloth is constructed of high grade material with thick, strong nap that does not pull out and its uniform length is such that the rolls are completely cleared of all short fibre.
Our Slasher Cloth is made of the best material of sufficient cushion and porous to thoroughly force the sizing into the yarn.

Let us send you a trial order. Write us.

PHILADELPHIA FELT COMPANY

FRANKFORD, PHILADELPHIA, PA.
Southern Sales Agent: M. C. Sanders, Greenville, S. C.

JACQUES WOLF & CO.

Manufacturing Chemists and Importers

PASSAIC, N. J.

ALL FINISHING and SIZING PRODUCTS for COTTON

ANTISTAIN
MONOPOLE OIL
Reg. Trade Mark No. 70991
BLEACHING OIL
Kier boil Assistant
HYDROSULPHITE
For stripping and discharge printing
CREAM SOFTENERS
ALIZARINE ASSISTANTS

Uniform in Application

VICTROLYN

Penetrating, Lubricating, Dependable Assistant in Warp Sizing

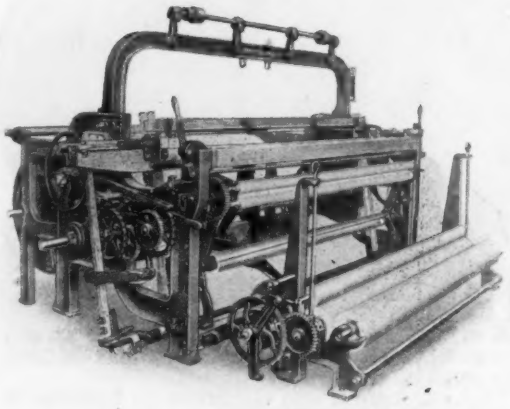
KLORASENE

will remove Oil Stains.

If you are troubled, write us.

BOSSON & LANE
Manufacturing Chemists
ATLANTIC, . MASS.

CORD FABRIC LOOM



The picture shows the Crompton & Knowles Cord Fabric Loom with Double Roll Independent Winder.

This loom weaves cloth 60" wide and with picks 2½ to 12 per inch as desired.

This is the standard weaving unit in the production of cord fabric for automobile tires. It is used almost exclusively throughout the United States in weaving the tremendous annual production of cord fabric.

CROMPTON & KNOWLES LOOM WORKS

WORCESTER, MASS.

PROVIDENCE, R.I. PHILADELPHIA, PA. PATERSON, N. J.

ALEXANDER & GARSED, CHARLOTTE, N. C.
Southern Representatives.

Thorough and Uniform In Its Performance

The SARGENT Yarn Conditioning Machine is absolutely thorough and uniform in its performance, and requires only 60 seconds to produce the best results.

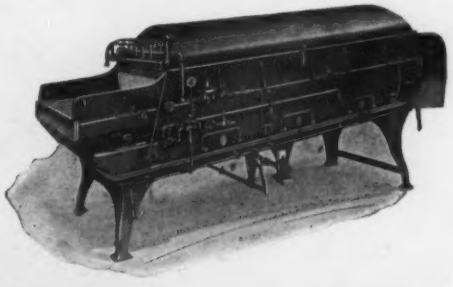
Progressive mill men no longer tolerate imperfections from "Kinky Filling" or the uncertainties of old fashioned systems of conditioning.

The Sargent Yarn Conditioning Machine sets the twist, restores proper degree of moisture with accuracy, rapidity, and thoroughness. Hour after hour, day after day with the same uniformity of results.

The many mills who use the Sargent is one proof of its leadership and superiority.

May we hear from you on your requirements?

Ask today for interesting booklet on yarn conditioning.



C. G. SARGENT'S SONS CORPORATION
GRANITEVILLE, MASS.

Fred H. White, Southern Agent, Charlotte, N. C.

SARGENT YARN CONDITIONING MACHINE

What Part of the Spool is First to Wear Out?

Your superintendent will confirm our statement that 99% of all Warper, Twister or Spooler Spools become useless on account of the heads breaking, wearing rough or loosening. This is true of all types of Spools heretofore on the market.

With the Lestershire Type Vulcanized Fibre Head Spools just the opposite is true. The Heads will outwear the barrels because Hard Vulcanized Fibre (the same material from which end thrust bearings and automobile gears are made) will never break, wear rough nor splinter.

Of course the first cost is higher but, figuring your charges per thousand spools per year, they are by far the most economical spools on the market today.

In addition Lestershire Fibre Head Spools will in the ordinary mill give you an increased unloading production of nearly 50%. Put a row on your creel and compare the time necessary to unload with any other type Spool.

On the smooth Rock Maple barrel, cleanly jointed to the Fibre Heads which cannot get rough and cannot be dented, there is no place for the yarn to catch.

Spindle wear is also eliminated by bushings of hard well seasoned Dogwood.

Increased traverse can be had which will give you greater yardage on your spools. This means a saving of many dollars in the course of a year, not only direct but in labor required to change the spools.

At your request we will gladly send samples for purposes of test and comparison.

LESTERSHIRE SPOOL & MFG. CO.

Manufacturers Mill Spools, and Bobbins, of Every Description

JOHNSON CITY, N. Y.

WALTER L. PARKER CO.

LOWELL, MASS.

Manufacturers of Bobbins, Spools and Skewers

OUR SPOOLS:—

Are made to stand severe service and are made from thoroughly dried stock, so constructed that they are giving entire satisfaction.

OUR BOBBINS:—

Are made from the best grade of stock, and through the efficiency of our workmanship, are true running, and properly fitted on spindles.

OUR PRODUCTS:—

Bobbins—Warp and Filling. We put on all kinds of metal shields and caps.
Speeders—Plain; steel rings; metal base.
Spools—Warper; Twister.
Our Metal Bound Spools are pronounced the best on the market.
Skewers—Cop, Warper and Roving, of all descriptions.
Twisters—Universal Winder Rolls and Bobbins, Comber Rolls, etc.

We Specialize in New Mill Equipment

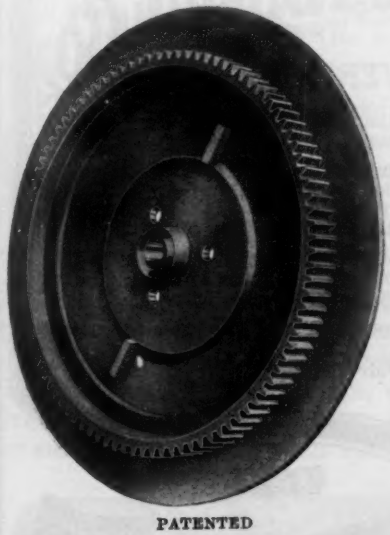
CHARLOTTE SUPPLY CO., SOUTHERN AGENTS.

All Steel Loom and Section Beam Heads

Mill Executives are Specifying All Steel Heads on New Equipment.

STEEL heads represent permanent equipment. The first cost is the only cost.

Once installed all expense of maintenance is eliminated.



PATENTED

GUARANTEED not to bend or spring under pressure of warp or handling of beams. Constructed to duplicate present cast-iron heads.

Ask for samples.

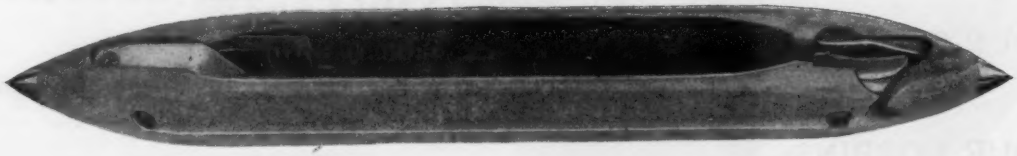
PATENTED

Mossberg Pressed Steel Corporation

Attleboro, Mass.

Southern Representative:
Southern Textile Specialty Co., Greenville, S. C.

The J. H. WILLIAMS CO.



O. K. Automatic Shuttles
Wire Heddles, Heddle Frames

MILLBURY, MASS.

Geo. F. Bahan, Southern Representative.

VERMONT SPOOL & BOBBIN CO.
OF
BURLINGTON, VERMONT.

There are two prime requisites in the production of superior bobbins and spools—the plant and long experience. We have both.

Our plant is equipped with the most up-to-date and efficient machinery. From the selection of the wood to the finishing of the product the same care is exercised in every department—uniform bobbins and spools of the highest class being the result.

Our long experience in the design and manufacture of spools and bobbins for textile mills all over the country enables us to understand your requirements and give you 100% satisfaction.

Give us a trial order and you will remain one of our satisfied customers. Write for prices.

"Good Goods at Fair Prices."

WASHBURN
KORE-LOKT PIN BOARDS

"The Old Bobbin Boxes are going"

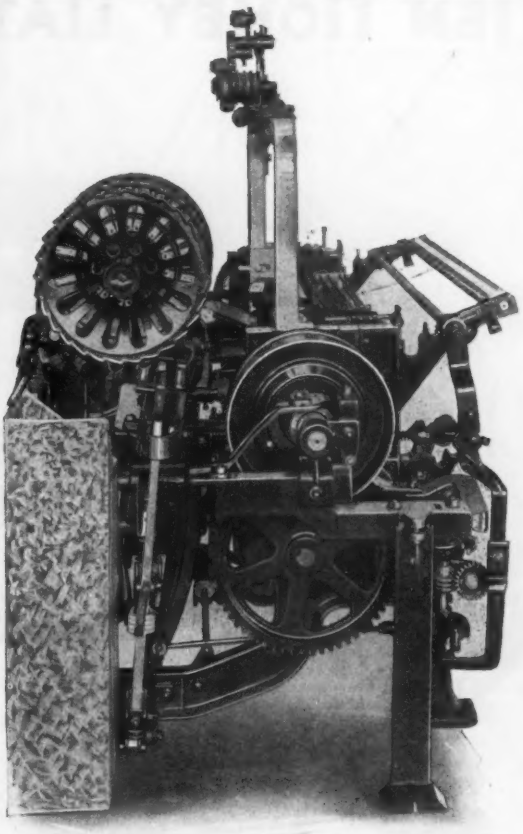
This cut shows a type of pin board construction which has successfully replaced bobbin boxes on looms.

There is a "Kore-Lokt" Pin Board to fit every textile need. Other styles are fitted with hollow or solid steel pins, with wire pins and with special wood pins, but in every type the Kore-Lokt principle is retained.

Be modern. Always consider your doffing problems in terms of pin boards. They are indispensable in measuring and controlling the operation of automatic looms. They answer every doffing requirement throughout the mill.

We invite superintendents and overseers to correspond with us concerning pin board systems. Let us send you a list of prominent mill users, each and every one of whom considers pin boards an essential factor in their success.

NEW BEDFORD MASSACHUSETTS



The Latest
NORDRAY
Automatic Loom

Multiple-harnesss, Feeler type

built by

HOPEDALE MANUFACTURING CO.

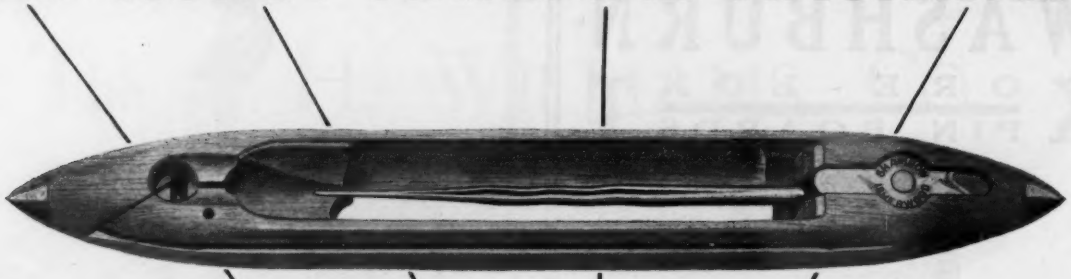
at MILFORD, MASS.

SOUTHERN OFFICE at
GREENVILLE, S. C.

This loom was shown at the Late Greenville Exposition and excited great interest.

It is Still the Simplest.

MEN MONEY MATERIAL MACHINERY



PROMPT DELIVERY

"HEART of the LOOM"

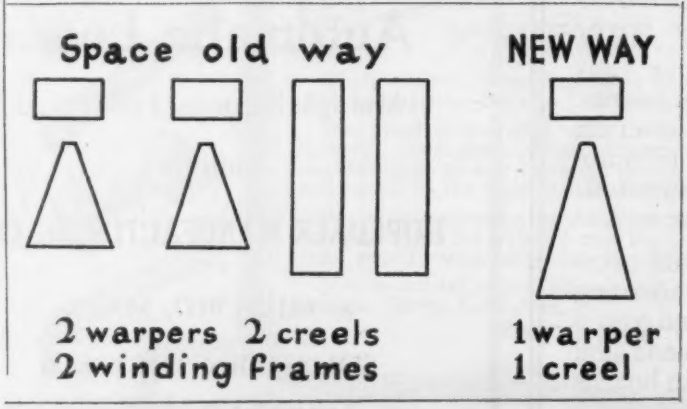
SHAMBOW SHUTTLE COMPANY

Woonsocket, R. I. Greenville, S. C. U. S. A.

JOHN C. SHAMBOW. Pres. & Treas. H. H. ULLMAN, V. Pres. & Gen. Mgr.

NEW AUTOMATIC CREEL

for direct warping from FILLING WOUND BOBBINS



COMPLETELY ELIMINATES the

Spooling of the yarn

Spooling waste

Undue and irregular tension of yarn due to spooling

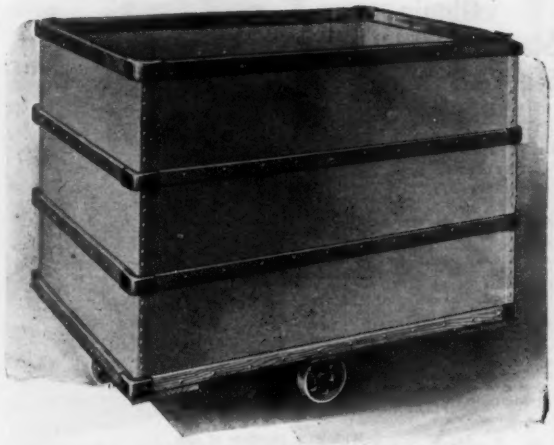
Stoppage for doffing

Doffing is done while warper is running.
Greater production from better warps at lower cost.
Better loomage from auto-creel warps because
Elasticity is preserved in yarn.

For Information address

AUTO CREEL CORPORATION, NEW YORK

Room 915, Fifth Ave. Building
Alfred Suter, Sales Manager



Keystone Fibre Warehouse Cars

The best proof of their superior durability is that they have stood the test of hard usage—plenty of it.

Made of thoroughly seasoned tough and strong Keystone Fibre that will not wear rough, crack or splinter. Reinforced at points that receive the hardest service.

Keystone Fibre Cars are lighter and easier to handle.

Orders filled through any responsible mill house, or direct. Send for catalog of mill supplies.

Keystone Fibre Company
Box 441, Wilmington, Delaware

Southern Representatives: Wilson Company, Howard Bank Bldg., Washington St., Greenville, S. C.; New York Office: 30 Church St.; Chicago Office: 565 West Washington Blvd.; Philadelphia Office: 7 South 17th St.; Boston Office: 176 Federal Street.

The Scrubbing Engineer
Makes Scrubbing a Profit -Not an Expense!

At your service!—the Scrubbing Engineer!

He comes to rid employers of the waste and extravagance of antiquated hand-and-knee scrubbing. He comes to liberate industry from the drudgery—and the dirt—of the pail and scrubbing brush. He heralds the adoption of *electric* scrubbing by all business! He brings *you* a message that warrants your hearty welcome.

The scrubbing engineer will gladly show you, without obligating you in any way, how you can get floors *really clean* for less time, labor and money than partially clean floors now cost you.

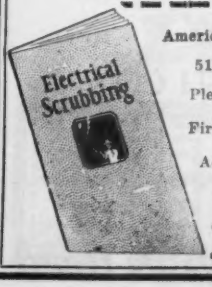
Booklet, "Electrical Scrubbing," Free

A copy is yours on request. This history of the application of electricity to scrubbing will interest you. Send for it now while you think of it.

AMERICAN SCRUBBING EQUIPMENT CO.
General Offices and Factories
HANNIBAL, MO.
District Offices in Principal Cities.

"Clean Floors Reflect Clean Business"

FINNELL SYSTEM
OF ELECTRIC SCRUBBING



EXECUTIVE'S MEMO.

American Scrubbing Equipment Co.
51 N. Collier St., Hannibal, Mo.
Please send brochure shown here to
Firm Name .....
Address .....
My Name .....
Title .....

you know how essential they are

TEXTILE BRUSHES are essentially good brushes—otherwise, they do not fulfill the requirements of cotton mills, and that is why we are such sticklers for quality and workmanship in the manufacture of brushes for the textile industry.

It is not a coincidence that nine-tenths of all brushes used in Southern cotton mills are our product. There is something behind the fact—a vital reason.

We are constantly striving to better our own best. We are continually working with the cotton mill people, trying to improve wherever improvements can be made.

If you should need a different shape or size, we will make it—gladly.

Send us your repair work. We do that too—and promptly.

ATLANTA BRUSH CO.
ATLANTA, GA.

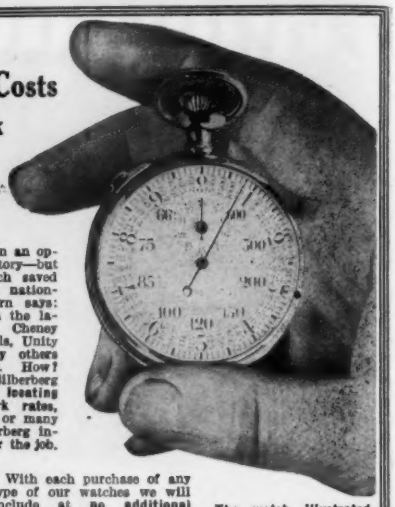
ATLANTA BRUSH COMPANY

A Brush for every Textile Need

Obtain Standardized Costs Set Piece Work Rates

Here's the Watch for Every Textile Time Study Job

Only six seconds waste on an operation in an eastern factory—but locating it with the watch saved thousands every year. A nationally known Textile concern says: "We eliminated one-fourth the labor, cut costs by 22%." Cheney Bros., Champlain Silk Mills, Unity Spinning Mills and many others are doing the same thing. How? By Time Studies with Silberberg watches. Whether it's locating wastes, setting piece work rates, establishing bonus systems or many other uses—there's a Silberberg instrument specially made for the job.



The Decimal Duration Watch—Gives production figures up to three minute jobs with special arrangements for timing jobs up to 30 minutes. It also has the decimal dial and "take out time" feature.

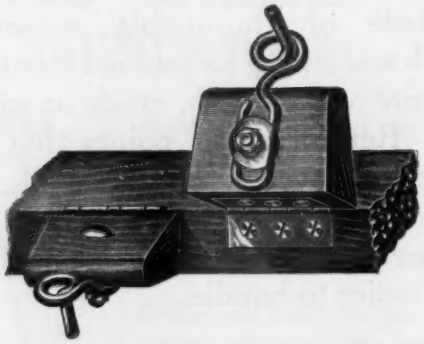
With each purchase of any type of our watches we will include at no additional charge one set consisting of our 3 Text Lesson Course on "TIME AND MOTION STUDY" including how to set Piece Work Rates and how to obtain accurate Labor Costs. All data contained therein broadens the scope and use of Time Study Watches in the Industries. This course regularly sells for $10.00. Absolutely FREE with each Watch. Send for illustrated pamphlets and catalogues. Any of our instruments on approval to responsible concerns.

MORTIMER J. SILBERBERG CO.
Peoples Gas Bldg.
CHICAGO
Pioneers in the Manufacture and Sale of Time Study Watches.

The watch illustrated at the top with the decimal dial and "take out time" features gives direct readings in production per hour up to one minute jobs.

The Master Chronograph

The Palmer Adjustable Thread Guide



For Ring Spinning and Twisting Frames

Easily Adjusted.

Extreme accuracy and permanence of setting.

Cheapest of them all.

Mail guide-block for free sample.

Patented and manufactured by

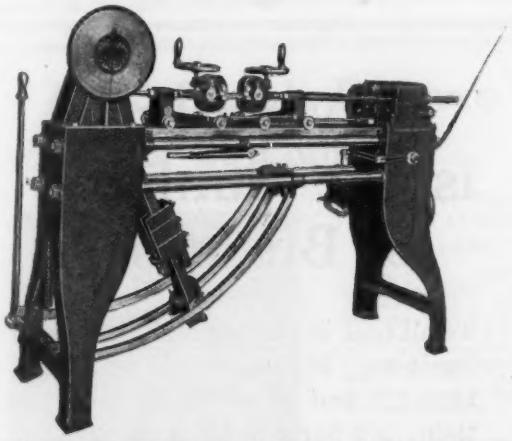
THE I. E. PALMER COMPANY
Middletown, - - - Connecticut

SCOTT TESTERS

Extract From The New Specifications For Numbered Cotton Duck for Commercial and Government Use

All tests for breaking strength shall be made on an approved type of inclination balance breaking machine. The maximum capacity of the machine shall be 800 pounds.

The 1 in. x 1 in. x 3 in. grab method of testing shall be used, defined as follows: The lower half of each pair of jaws shall be 2 inches or more in width, and the upper half shall be 1 inch in width. Jaws shall be planed smooth and flat, with edges slightly rounded to prevent cutting. The initial length of the test pieces between the jaws of the testing machine shall be 3 inches, and the pulling jaw shall travel at a uniform rate of 12 inches per minute.



SCOTT HORIZONTAL INCLINABLE BALANCE TYPE FABRIC TESTER, 800 LBS. CAPACITY

Official equipment in Government Offices and Technical Institutions and for over ten years the preference of the trade for tests of heavy fabrics.

The machine whose constant dependable performance has won for itself the position of THE RECOGNIZED AMERICAN STANDARD and the only one that ever met the requirements for both laboratory and routine testing.

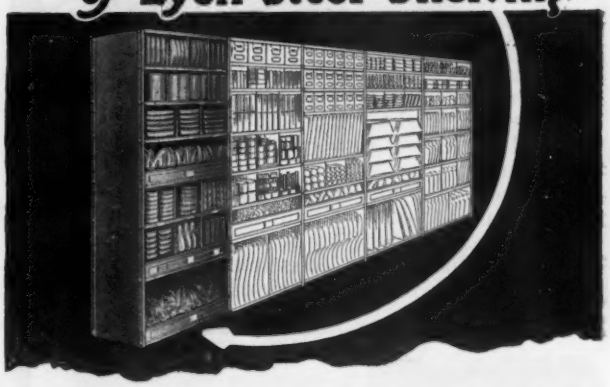
We also make the Standard Equipment for testing Yarns, Twines, Light Fabrics, Rubber, etc.

Catalog on request.

HENRY L. SCOTT & CO.

BLACKSTONE & CULVER STS., PROVIDENCE, R. I.

Start With a Single Section of Lyon Steel Shelving—



LYON STEEL SHELVING

Add To It As Needed.

When you need additional capacity—when a wooden rack must be replaced—when a new requirement for storage space arises—use LYON STEEL SHELVING. Shipped from stock, in standard sizes, and erected without the need for special tools, it can be added to, rearranged or moved, any time —a week, a month or a year from now.

Those who use Lyon Steel Shelving find it surprisingly economical. Its first cost is scarcely more than wood while its adjustability and durability make it a permanent investment.

Do not think of steel shelving as usable only for special requirements. Lyon Steel Shelving will store anything.

Asking the nearest District Office for more information incurs no obligation.

LYON METALLIC MFG. CO.

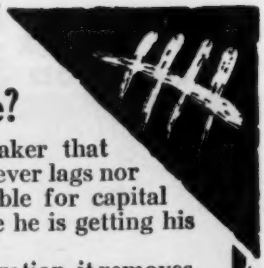
AURORA, ILLINOIS

New York Chicago Boston Philadelphia Pittsburgh Rochester Los Angeles Detroit Indianapolis Cleveland

There is an office in nearly every city. Write for address.

LYON STEEL PRODUCTS

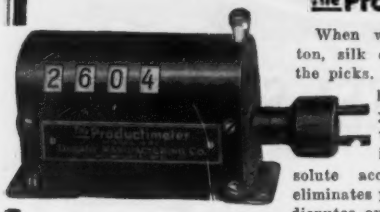
Are You Getting Your Share?



Here's a little pace-maker that never gets discouraged, never lags nor tires. It makes it possible for capital and labor each to be sure he is getting his rightful share.

Used on almost any operation, it removes the monotony, brightens and lightens the day's work, resulting in a net increase in production, with consequent profits to both employer and workman.

The Productimeter



When weaving woolen, cotton, silk or even bags—count the picks. If they are counted by the Productimeter, you will know exactly what the true total is, all the time. Absolute accuracy in counting eliminates possible mistakes and disputes over output.

30 DAYS ON TRIAL—We'll gladly let you use one for a month. If you don't find it brings about better conditions, send it back in good order and we'll cancel the charge.

Our catalog will be of interest to you.

DURANT Manufacturing Company (1393)

633 Buffum St.
Milwaukee, Wis.

AMERICAN SUPPLY COMPANY

PROVIDENCE, R. I.

MANUFACTURERS OF

Loom Harness,
Weaving Reeds,
Oak Tanned Leather
Belting, Strapping,
Etc.

We make a specialty of Harness for Warp Drawing Machines

NOTE—No orders too large for our capacity. None too small to receive careful attention.

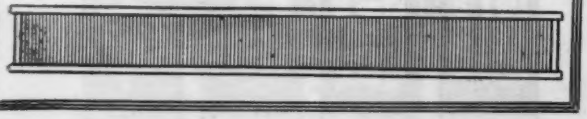
REEDS

For Cotton, Woolen, Worsted, Silk, Tire Fabrics, Webbing, and Wire Cloth.

We make a specialty of all Metal reeds, for Tire Fabrics, and Leno work.

HAYES LOOM REED & HARNESS CO.

182 Farm St. Woonsocket, R. I.



Advertising is the Sunlight of Business

To all that is healthy and vital in business, it means increased strength and growth; but advertising is a fierce heat which withers and consumes that which is unsound.

A business which is not a good business should not be advertised. A business which would not benefit from widespread appreciation of its ideals had better acquire a new set of ideas.

Published by COTTON in co-operation with The American Association of Advertising Agencies

TRADE MARK

LOWELL MILL CRAYONS

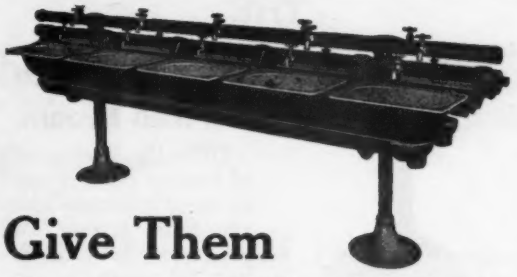
the original crayons for textile mill use, and for years the standard with America's leading mills.

Lowell Crayons are made in white and 15 colors, as follows:

1	2	3	4	5	6
Yellow	Red	Pink	Blue	Purple	Brown
7	8	9	10	11	
Black	Green	Orange	Dark Green	Light Red	
12	13	14	15		
Rose Pink	Light Green	Light Blue	Orange No. 2		Wh.

Order by number, please.

LOWELL CRAYON CO.
Lowell, Mass.



Give Them Sanitary Washbowls

When you consider the low cost of installing the really best kind of washing-up equipment, you will want to know more about MEECO Individual Sanitary Washbowls.
Made single and double in batteries of any number. For 15 years the Standard Mill and Factory Washbowl.

Write Today for Catalogue and Prices.

Lockers
Chairs
Drinking Fountains

METAL MEECO PRODUCTS

Shelving
Partitions
Boxes and Cabinets

Manufacturing Equipment and Engineering Co.
BOSTON, MASS.

At 60 Pounds Pressure or 20 Pounds

The Halsey Taylor Stream is ALWAYS THE SAME.

Line pressure varies—down one second to 20 pounds and up to 60 the next and the drinker gets a good splash in the face when it changes, or water is thrown onto the floor—UNLESS he is drinking from a Halsey Taylor Drinking Fountain.

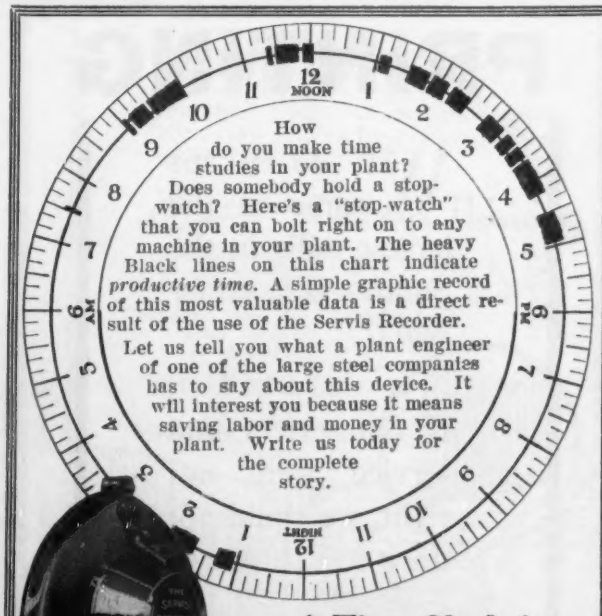
In Halsey Taylor Drinking Fountains, the very latest and the very highest development in fountains, the stream never varies — NEVER TOO HIGH — NEVER TOO LOW—it always flows smoothly, evenly and provides a comfortable, convenient, refreshing and sanitary drink.

Your workman needs these advantages and the most positive assurance you have getting them is to install Halsey Taylor Drinking Fountains with the Automatic Stream Control and The Perfect Drinking Stream.

There is a Halsey Taylor type for every purpose—there's one to suit your exact needs.

Write for literature and make your selection.

The Halsey W. Taylor Co.
538 No. Park Ave.,
Warren, Ohio.



How do you make time studies in your plant? Does somebody hold a stop-watch? Here's a "stop-watch" that you can bolt right on to any machine in your plant. The heavy Black lines on this chart indicate *productive time.* A simple graphic record of this most valuable data is a direct result of the use of the Servis Recorder.

Let us tell you what a plant engineer of one of the large steel companies has to say about this device. It will interest you because it means saving labor and money in your plant. Write us today for the complete story.

A Time Clock for Textile Machinery

$28.00 complete

The Service Recorder Company
Cleveland

THE
"Southwestern" Iron Clad
Is the IDEAL Cotton Mill Broom

Only the best grade of broom corn is used in these brooms—they are built strong and will withstand the hardest usage.

The light weight, yet strong and substantial shields used gives the broom ample protection and at the same time allows the proper amount of broom corn to be used, thus giving them excellent sweeping qualities.

MADE RIGHT!
PRICED RIGHT!

Inquiries and orders receive prompt attention.
Sold direct and through
all principal distributors.
The Southwestern Broom Mfg. Co.
Evansville, Indiana

A World's Record for Court Typing

Louis J. Tannenholz of New York, made a word's record for law reporting typists at the convention of the New York State Shorthand Reporters' Association at Syracuse, N. Y., Dec. 29, 1921.

On an old No. 4 L. C. Smith, which he has used in his business continually since 1914, he wrote 92 words a minute for 16 minutes of court testimony, read to him directly as he wrote.

"To my mind," said Mr. Tannenholz, "the great thing about winning was not only the speed shown by me but also the wonderful endurance of the typewriting machine that will stand up to work as my L. C. Smith does after eight years of constant pounding.

"My estimate is that it has ground out approximately 300,000 pages of testimony and solid matter in that time, averaging 225 words to the page, or 67,500,000 words—and the only repair necessary on the machine in all that time was when a messenger boy dropped and broke the right hand carriage return lever, necessitating replacement."

Let us show you the "Silent Smith." A phone call or request for catalog will place you under no obligation.

L. C. Smith & Bros. Typewriter Company
Factory and Home Office : SYRACUSE, N. Y.
Branches in all Principal Cities.

PRINTING

WE do it for some of the largest mills in the South—*Why not for yours?*

If our prices and service were not right, we could not do it.

THE
A. J. SHOWALTER
COMPANY
Dalton, Georgia.

Convenient for quick reference
Catalogs, price lists, rate books and other important reference papers are immediately at hand in the
Kleradesk
They are out of the way in their indexed compartments until wanted. It also sorts and routes mail, memos, orders, etc., for all to whom mail is distributed. Saves time. Efficient. Convenient.
A Steel Sectional Device
Add compartments as required. Sections 75c. each. Six-compartment Kleradesk illustrated below only $5.25 Indexed front and back. Write for free, instructive, illustrated folder, "How to Get Greater Desk Efficiency."
Ross-Gould Co.
318 N. 10th—St. Louis (9)
New York Philadelphia
Chicago Cleveland

Zemco-lite

TRADE MARK

"The Cement Paint"

A Permanent Mill White Backed by a Permanent Organization

In your mill you want the utmost in quality. You want a mill white that has made a good name for itself.

Through sheer quality of all its constituents, "ZEMCO-LITE" has earned for itself an important place in the textile industry.

By its great adhesive qualities, its time resisting and light refracting properties it has stamped its name indelibly upon the minds of shrewd purchasers of mill-whites. "ZEMCO-LITE" is truly the mill-white for your mill.

We are in the paint business to serve our customers with what they want—and when they want it.

Our staff of experts and our fully equipped laboratory are at the service and disposal of all the textile industry.

Begin the New Year right. Let us assist you to make 1923 the year of "more light in your mill" with ZEMCO-LITE "the cement paint."

We also carry a complete line of mill village paints in various attractive colors. Write us for color card and complete details.

Prepare now for your spring requirements.

AMERICAN CEMENT PAINT CO.

Chattanooga, Tenn.

"CEMENT FOR PERMANENCE —WHY NOT ZEMCOLITE!"

Safety in That "Vertico-Slant" Stream

DRINKING fountains must be absolutely sanitary if they are to safeguard the health and productiveness of your workers. Note the special sanitary construction of the R & S Fountain. The nozzle is down in a recess where it cannot be contaminated by the lips. The angle stream prevents germs from falling back into the jet. These features combined with the simple, durable construction of R & S Fountains specially fit them to mill use.

R. & S. Fountains

are sure to please you in every respect, and we ask that you write today for your copy of our attractive and interesting catalog.

Rundle-Spence Mfg. Co.

Milwaukee, Wis.

EFFICIENT HEATING

Demands radiators so constructed that every square foot is prime heating surface.

Bayley Chinook Heaters

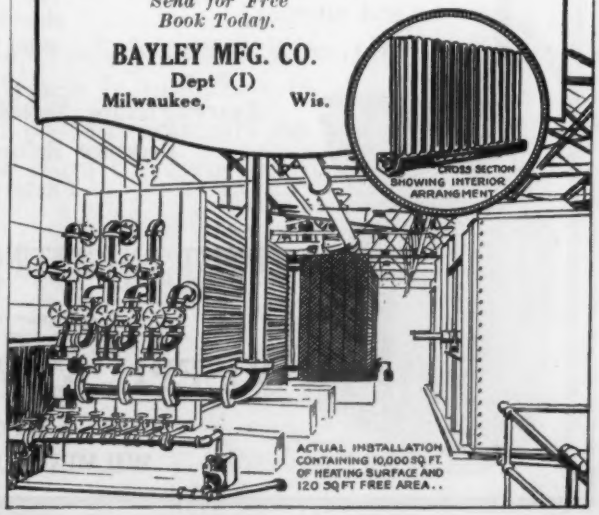
are built on the "Tube-Within-A-Tube" principle, every tube a complete radiator in itself, free from water hammer, return bends, elbows and nipples. Any tube can be removed without interfering with any other tube. Can be shipped K. D.

Send for Free Book Today.

BAYLEY MFG. CO.

Dept (I)

Milwaukee, Wis.


CROSS SECTION SHOWING INTERIOR ARRANGEMENT
ACTUAL INSTALLATION CONTAINING 10,000 SQ. FT. OF HEATING SURFACE AND 120 SQ FT FREE AREA..

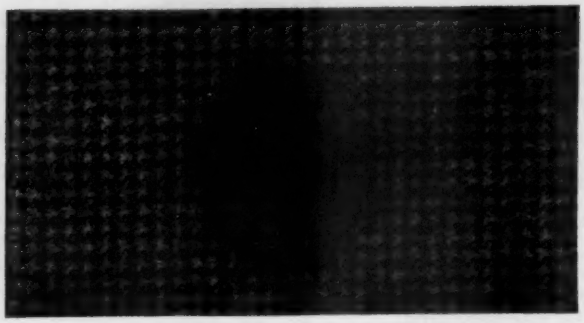
Stained Goods!

Hot Bearings mean short life.

Bearings are expensive.

Oil running out of bearings means dirty floors and machinery. RESULTS! WASTED MATERIAL FROM STAINED GOODS.

STAYSWELL laughs at drips and spatters.



STAINED GOODS ARE EASY TO AVOID BY USING THE SNOW-WHITE STAINLESS GRADES OF STAYSWELL

STAYSWELL "STAYS PUT" on the hottest bearing, eliminating all friction.

Let us quote you on your requirements.

LAMSON OIL CO., Inc.
10 Dorrance St. Wharf
PROVIDENCE, R. I.

VOGEL PATENTED

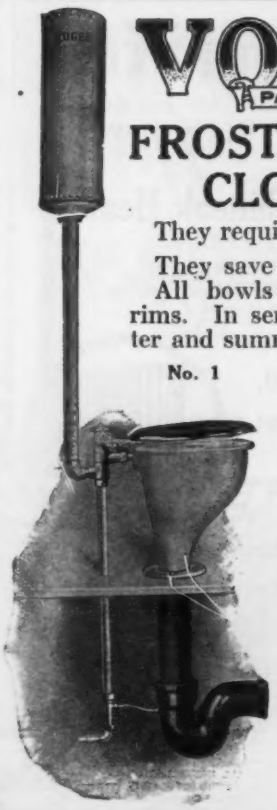
FROST PROOF CLOSETS

They require no pit.

They save water.

All bowls have enameled rims. In service daily, winter and summer.

No. 1



OVER 350,000

Giving

Satisfaction in All Climates

The ideal water closets for Factories and Mill Villages, where thousands have been installed.

The most durable water closets made — excepting none.

Every Fixture Tested Under Hydraulic Pressure Before Leaving Factory.

INSIST ON GETTING THE VOGEL

Ask your jobber

JOSEPH A. VOGEL CO.

Factory and Office at
WILMINGTON, DEL.

VOGEL PATENTED

No. 5 FACTORY CLOSET

This fixture fills the demand for a strong and durable automatic water saving closet outfit for factory use. The valve device is extremely simple and repairs, though seldom necessary, can be made by removing the valve cap back of bowl.

The Largest Installation of Individual Loom Motors in the World.

The Riverside and Dan River Cotton Mills, Inc., at Danville, Va., is an institution of which the textile industry and the entire nation is justly proud. This mill was carefully planned to the last item of equipment and the selection of a competent and resourceful organization of electrical experts to look after the power end was an important question.

The natural selection was the Walker organization—an organization of highly skilled individuals and technical experts whose work is cited as examples of perfection by the leading architects and engineers. No matter how large or how small the installation, Walker service means not only perfect service and satisfaction, but economy initially and permanently.

Ask for the handsome Walker book.

WALKER ELECTRIC & PLUMBING CO
ATLANTA, GEORGIA.

Branch Offices at Convenient Points Throughout the South

FOR Roofing and Siding, and all purposes in which Sheets are exposed to Atmospheric Corrosion,

use

Youngstown Copperoid Steel

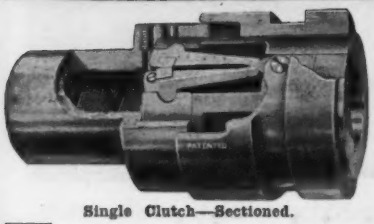
It resists rust and will far outlast ordinary steel, Wrought Iron or so-called "Pure Iron" made in open-hearth steel furnaces. At the same time it costs practically no more than ordinary steel and far less than the two metals last mentioned.

The Youngstown Sheet & Tube Company
Youngstown, Ohio

District Sales Offices:

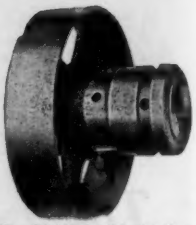
BOSTON—120 Franklin St.
NEW YORK—30 Church St.
PHILADELPHIA—Pennsylvania Bldg.
ATLANTA—Healey Bldg.
PITTSBURGH—Oliver Bldg.
CLEVELAND—Leader-News Bldg.
DETROIT—Dime Savings Bank Bldg.
CHICAGO—McCormick Bldg.
ST. LOUIS—1139 Olive St.
DENVER—First Nat'l Bank Bldg.
DALLAS—1401-2 Magnolia Bldg.
SAN FRANCISCO—604 Mission St.
SEATTLE—Central Bldg.

THE JOHNSON FRICTION CLUTCH

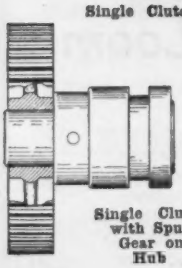


Single Clutch—Sectioned.

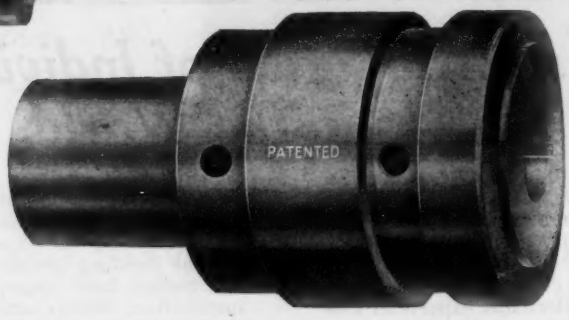
Cut the Cost of Power Transmission
by Using JOHNSON CLUTCHES
as Illustrated
"BE SURE IT'S A JOHNSON"

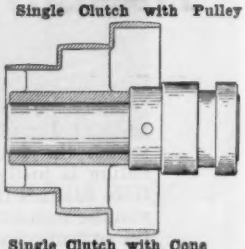


Single Clutch with Pulley

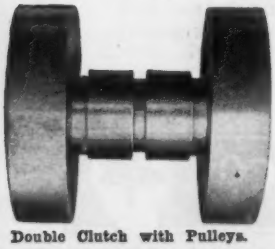


Single Clutch with Spur Gear on Hub





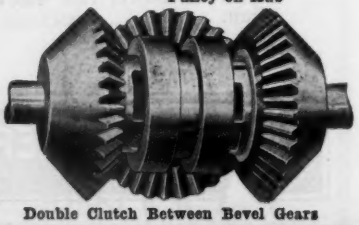
Single Clutch with Cone Pulley on Hub



Double Clutch with Pulleys.

THE JOHNSON SINGLE CLUTCH

WRITE
FOR
CATALOG "C"



Double Clutch Between Bevel Gears

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

CONCRETE — PERMANENT

DIXIE PORTLAND CEMENT CO. ROYAL CHATTANOOGA, TENN.

MR. TAXPAYER—YOU!

Do you want your country to spend YOUR good money on roads that will wear out before your bonded indebtedness is liquidated?

I SAY YOU DON'T.

What you want is a hard-surfaced road, with little cost for maintenance—a road that can be traveled in rain or snow, summer and winter. You want a PERMANENT road—that means CONCRETE!

Write for Literature—It's Free

DIXIE PORTLAND CEMENT CO.

CHATTANOOGA, TENN.

GET IN LINE—

Where the breaking strength of the yarn is a matter of importance Mill men are equipping their Slasher Cylinders with Ball Bearings.

Let us quote you on our Ball Bearing Truck Rollers. We have the easiest and most satisfactory method of applying ball bearings to Slashers.

A set will convince you.

AldricH MachinE

Ball WorkS Bearings

Greenwood, S. C.

BALL BEARINGS Chapman

"YOU PAY FOR THEM WHETHER YOU BUY THEM OR NOT"

Who Pays?

Who pays for the power that friction steals—right in your own plant?

You do! But that is because you have not become familiar with the famous CHAPMAN BALL BEARINGS.

Day after day, year in and year out, you keep on paying for power that you do not get—power that FRICTION consumes.

CHAPMAN-IZE NOW AND SAVE MONEY

Here is an investment that will save you money as long as you are a producer through the use of power—an investment that pays for itself in a couple of years. "CHAPMAN BALL BEARINGS ON ALL YOUR LINE-SHAFTING ELIMINATES FRICTION."

Fool-proof, trouble-proof, care-free are these enemies of friction—and they'll save you as much as 15% to 40% in power costs.

The saving is too great to ignore! You pay for CHAPMAN'S whether you buy them or not! Why not have them? THEY FIT YOUR PRESENT HANGER FRAMES

Drop us a line, and we'll be glad to tell you more.

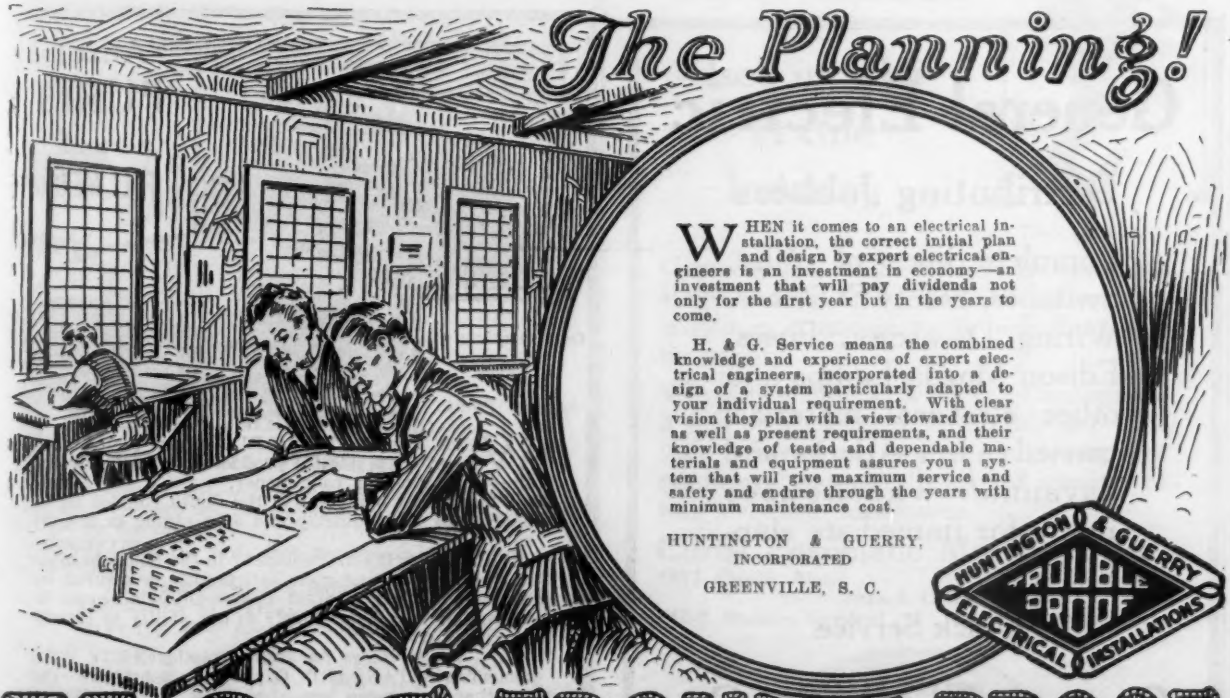
TRANSMISSION BALL BEARING COMPANY

1061 MILITARY ROAD BUFFALO, N. Y.

Branches: New York, Chicago, Philadelphia, Cambridge, Mass.; Toronto, Canada. Representatives in Principal Cities.

A few of thousands of plants NOW USING CHAPMANS As Standard Equipment

GILLETTE SAFETY RAZOR CO. Boston, Mass.
INTERNATIONAL MOTOR CO. Plainfield, N. J.
PIERCE-ARROW MOTOR CAR CO. Buffalo, N. Y.
OSTERLEIN MACHINE CO. Cincinnati, Ohio
GOULD & EBERHARDT Newark, N. J.
BETHLEHEM STEEL CO. South Bethlehem, Pa.
FORD MOTOR CO. Walkerville, Ont.
FISHER BODY CO. Detroit, Mich.
WATERBURY MAN'F'G CO. Waterbury, Conn.
ROCK ISLAND ARSENAL Rock Island, Ill.
BAUSCH & LOMB OPTICAL CO. Rochester, N. Y.
CHICAGO PNEUMATIC TOOL CO. Franklin, Pa.
CRUCIBLE STEEL CO. Jersey City and Pittsburgh
HOOVER STEEL BALL CO. Ann Harbor, Mich.
AMERICAN EVER READY CO. Long Island City, N. Y.
NATIONAL TOOL CO. Cleveland, Ohio
SUPERIOR GAS ENGINE CO. Springfield, Ohio
VICTORIA COTTON MILLS Rock Hill, S. C.



The Planning!

WHEN it comes to an electrical installation, the correct initial plan and design by expert electrical engineers is an investment in economy—an investment that will pay dividends not only for the first year but in the years to come.

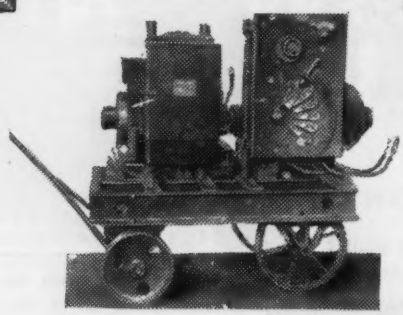
H. & G. Service means the combined knowledge and experience of expert electrical engineers, incorporated into a design of a system particularly adapted to your individual requirement. With clear vision they plan with a view toward future as well as present requirements, and their knowledge of tested and dependable materials and equipment assures you a system that will give maximum service and safety and endure through the years with minimum maintenance cost.

HUNTINGTON & GUERRY, INCORPORATED

GREENVILLE, S. C.

HUNTINGTON & GUERRY TROUBLE PROOF ELECTRICAL INSTALLATIONS

H. & G. TROUBLE-PROOF ELECTRICAL INSTALLATIONS



In The Modern Mill

—welding equipment is considered a vital item in the machine shop. In many mills all over the country you will find

G-E ARC WELDING SET

proving a profitable investment.
Just summarize the great savings that can be effected in YOUR mill through the use of the G. E. Arc Welding Set,—the arc welding equipment that is speedy and perfect in its performance.
If you are losing money year after year through the discarding of worn or broken machinery, you should consult us. We can show you very interesting facts.
We also carry a full stock of oxy-acetylene supplies—welding torches—latest improved—something new.
Write us your requirements. We can fill them.

George Bird Bruce Potts

WELDING ENGINEERS

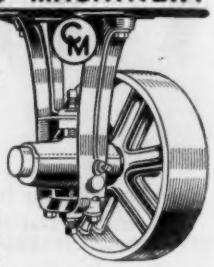
BIRD-POTTS CO.

WELDING Incorporated BUILDING

376-378 MARIETTA ST., ATLANTA, GA.

CRESSON-MORRIS

POWER TRANSMITTING MACHINERY



Power transmitting machinery
Shafting
Rope transmission
Machine moulded and cut iron and steel gears for heavy service.
Complete plant equipment.
Engineers; founders; machinists.
Sugar centrifugals.

CRESSON-MORRIS CO.

PHILADELPHIA, PENNSYLVANIA

Branch Office:
608 Little Bldg., 80 Boylston St., Boston, Mass.

2159-X

Sixty Years Experience as Engineers·Founders·Machinists

General Electric

Distributing Jobbers

Complete lines of Wire, Switches, Safety Switches, Wiring Devices, Fuses, Edison Mazda Lamps and other electrical materials carried in our Atlanta and Savannah warehouses ready for immediate shipment.

Quick Service

Carter Electric Co.

(WHOLESALE)

21 Haynes St. Atlanta, Ga.

Our completely equipped Oxygen Plant.

Absolute PURITY and FULL MEASURE

WHEN buying STANDARD Oxygen, you are assured of a quality product that is absolutely pure—full value for your money.
The location of our plant in the South enables us to supply your needs quickly and at a saving in freight charges.
STANDARD is the first company in the South to manufacture oxygen and your satisfaction is assured by the fact that our business has steadily increased in the last two years, due solely to our ability to satisfy our customers.

Write us for full particulars.

Remember—STANDARD Oxygen is 99.5% pure—the best that money can buy.

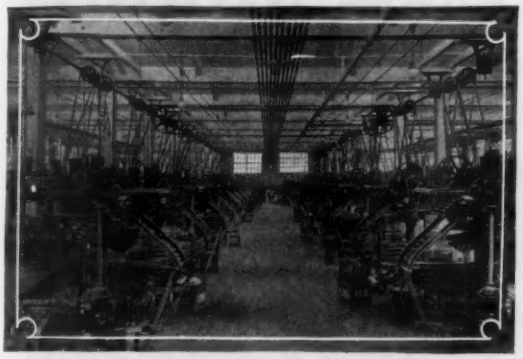
STANDARD GAS PRODUCTS CO., INC.
ATLANTA, GA.

STANDARD

WELDING APPARATUS AND SUPPLIES

GOOD LEATHER BELTING

Rhoads Long Lasting Tannate



LIGHT double leather belts work better than singles, especially wide singles, on many drives with pulleys above five inches in diameter.

The doubling increases the transmission capacity, reduces the liability to stretch and makes possible a more even thickness.

On many textile drives you can use, to great advantage,

RHOADS TANNATE LIGHT DOUBLES

They run truer than singles, have unusual grip; which saves your power and reduces cost of production by increasing output.

For economy and satisfaction specify "Rhoads."

The excellent service of Rhoads Belts can be prolonged by treating them at proper intervals with Rhoads Leather Belt Preserver.

J. E. RHOADS & SONS

PHILADELPHIA, 30 N. THIRD ST.
NEW YORK, 120 BEEKMAN ST.
CHICAGO, 230 W. RANDOLPH ST.
FACTORY AND TANNERY, WILMINGTON, DEL.

BETTER **NON-FLUID OIL** LUBRICATION

Save Your Time and the Mill's Money

TRY

TRADE MARK REGISTERED IN **NON-FLUID OIL** UNITED STATES PATENT OFFICE

Modern Textile Lubricants
On Your Machines

It won't waste out of bearings, like liquid oil and lasts longer—need not be applied so often—and does not get on the cotton.

NON-FLUID OIL costs less per month for better lubrication.

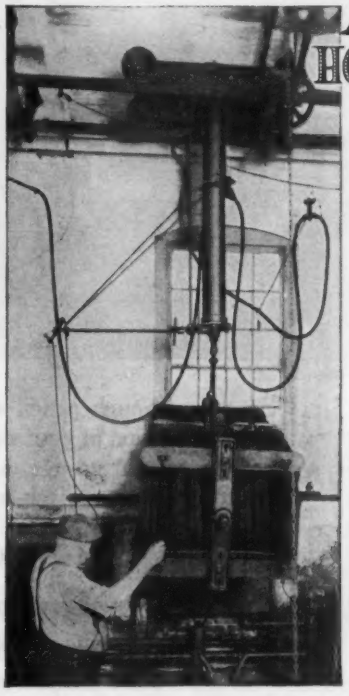
Testing samples and Bulletin on the Lubrication of Textile Machinery are free—just send your name on a card.

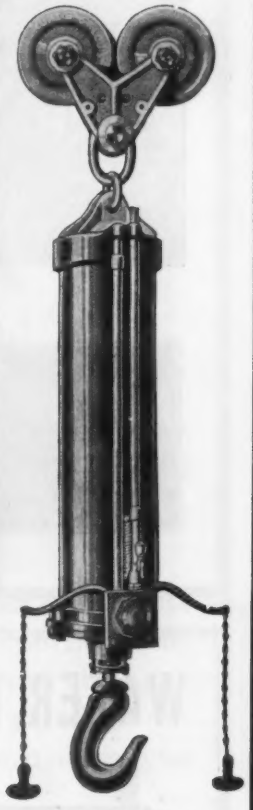
NEW YORK & NEW JERSEY LUBRICANT CO.
401 Broadway New York
Southern Agent, L. W. Thomason, Charlotte, N. C.
Ample Stocks at Our Branches:
Charlotte, N. C.; Greenville, S. C.;
Atlanta, Ga.; New Orleans, La.

AT LESS COST PER MONTH

CURTIS

AIR HOISTS





Used in The Textile Industry

"Lift it with air

Curtis one man All Steel Air Hoists and Curtis Roller Bearing Trolleys are effecting important economies in leading textile mills throughout the country.

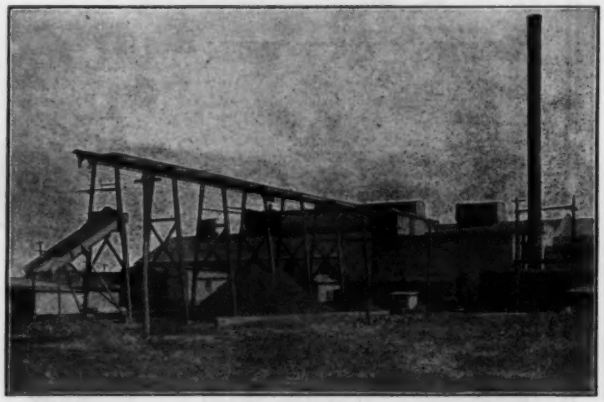
Why not install a Curtis Air Hoist and operate it with the air you now have available? The wide variety of uses to which Curtis equipment can be most economically applied is worthy of your immediate investigation.

Curtis Pneumatic Machinery Co.
1571 Kienlin Ave. St. Louis, Mo.
Branch Office
532-R Hudson Terminal New York

CURTIS
AIR COMPRESSORS-HOISTS-TROLLEYS-CRANES
ST. LOUIS
© C.P.M.Co.

Established 1854

More Coal For Less Money



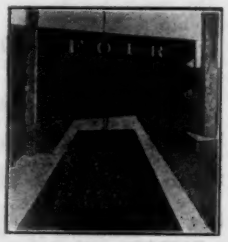
The price you pay for coal represents only a portion of its actual cost. The items that make up the difference are the handling and demurrage charges.

You can put a stop to this expense by installing a *Godfrey Conveyor* that will cost you no more than the price of a good truck.

One man unloads a car of coal in an hour and a half and conveys it to the boiler room or outside storage, at a power and labor cost of from five to seven cents a ton. Above illustration shows how ashes are also handled efficiently with this equipment.

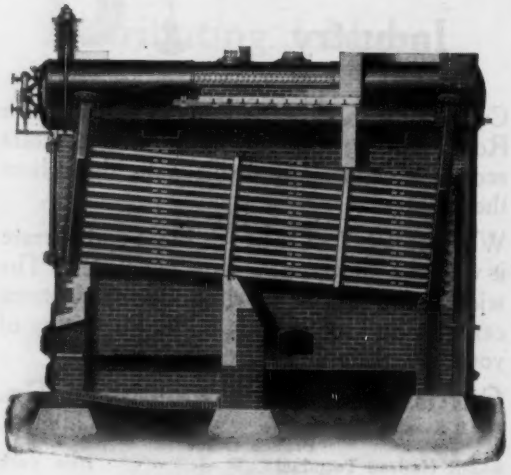
Send us a rough pencil sketch of your power plant, showing location of your siding in relation to bins, boiler room or outside storage, and our engineering staff will submit a careful analysis of your requirements, without cost or obligation.

Ask for Catalog Z



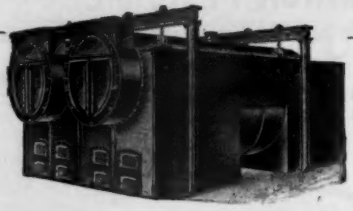
Godfrey Conveyor Company
Elkhart, Indiana, U. S. A.

WATER TUBE BOILERS



HORIZONTAL WATER TUBE BOILERS
VERTICAL WATER TUBE BOILERS
TUBULAR AND MARINE BOILERS
STEEL CASINGS, SMOKE STACKS

THE CASEY-HEDGES CO.
CHATTANOOGA, TENN.
Quick Shipment Our Specialty. Send for Catalogs.



The Result of a Quarter Century Experience

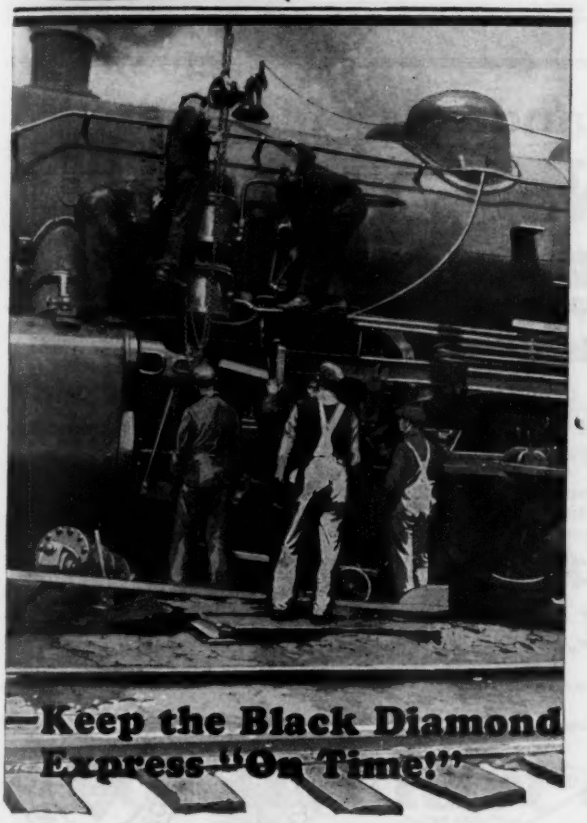
These years of experience and study together with exhaustive tests and improvements, has enabled us to build modern boilers that are second to none—in design, construction, high efficiency and capacity, economical operation, and low cost for upkeep.

Made in several types. Write us today and let us send you full data and reasons why the W & W BOILER will best meet your requirements.

The Walsh & Weidner Boiler Co.
CHATTANOOGA, TENN.

WALSH & WEIDNER
TUBULAR WATER TUBE **BOILERS**

CYCLONE HOISTS
HIGH SPEED



—Keep the Black Diamond Express "On Time!"

THE locomotive was wanted in a hurry for the Black Diamond Express when the air pump was discovered to be out of order. The old compressor had to be taken out and replaced by a new one. Due to the ease and speed with which the heavy parts could be handled with the handy Cyclone, the fast working mechanics were able to finish in time for the engine to go out on its run.

This incident which happened at the Wilkes-Barre, Pa. Roadhouse of the Lehigh Valley R. R. is typical of the hurry-up jobs handled daily by Cyclone Hoists. For fast lifting use a Cyclone!

Catalog of C-M Hoists, Cranes and Trolleys on request

The Chisholm-Moore Mfg. Co.
Cleveland, O.

Hoists Cranes Trolleys

Branches
New York
Chicago
Pittsburgh

Distributors in all localities

REG. U.S. PAT. OFF. TRADE JENKINS MARK Jenkins Bros.

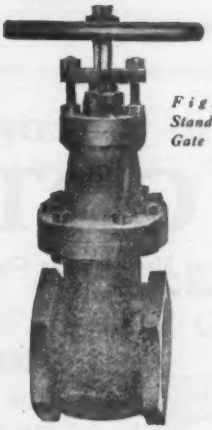


Fig. 925—Jenkins Standard Iron Body Gate Valve, screwed.

Jenkins method of manufacture—

The care exercised, and the standard set and maintained must necessarily produce a superior valve.

Every Jenkins is cast of the best metal and in a proportion that secures a heavier and stronger valve—one that is safe and dependable in severe as well as average service.

Valves for all requirements. Know the genuine by the Jenkins Diamond and signature.

JENKINS BROS.

New York Boston Philadelphia Chicago
Montreal London

FACTORIES: Bridgeport, Conn; Elizabeth, N. J.; Montreal, Can. 2348

Jenkins Valves
SINCE 1864

Commission Merchants, Yarn Dealers, Cotton Dealers and Brokers, Banks, Etc.

The Recognized Standards of Quality

COTTON YARNS

Gray Manufacturing Co.
Arrow Mills, Inc.
Parkdale Mills, Inc.
Flint Manufacturing Co.
Arkray Mills, Inc.
Arlington Cotton Mills
Myrtle Mills, Inc.

Our Fine Yarns Make Fine Fabrics

The manufacturers of a number of America's well known textile products can vouch for the strength, uniformity, cleanliness and better weaving and knitting qualities of our yarns.

The yarns we spin for knitting, weaving, laces and converting, are furnished in all twists on skeins, cones, tubes and warps:

30s to 80s Single and Ply Combed Peeler Right Twist. 30's to 50's Single and Ply Double Carded Peeler, Right or Reverse Twist.

20s to 60s, 2, 3, and 4 Ply, Combed Peeler, Reverse Twist.

Our products are sold direct and exclusively through our General Sales Offices:
225 Fifth Avenue at 26th Street, New York.
H. A. FLORSHEIM, Sales Manager
Long Distance Phone:
Madison Sq. 7666-7-8 and 9.
BRANCH OFFICES { Boston, Philadelphia, Chicago

GRAY DAWN QUALITY YARNS Gray Manufacturing Co. Gastonia, N.C.

ARROW MILLS COMBED YARNS GASTONIA, N.C.

MYRTLE MILLS INC. COTTON YARNS GASTONIA, N.C.

PARKDALE MILLS, Inc. PARKDALE YARNS ARE THE BEST GASTONIA, N.C.

ARLINGTON COTTON MILLS COTTON YARNS GASTONIA, N.C.

FLINT MFG. CO TRADE MARK FLINT GASTONIA, N.C.

Weimar Bros.

Phone Connections
Works, 2046-48 Amber Street,
PHILADELPHIA, PA.

MANUFACTURERS OF
Cotton Mercerized Tapes, Spool Tapes, Bindings and Narrow Fabrics for Underwear and other Trades.

WOODWARD, BALDWIN & CO.

DRY GOODS

Commission Merchants

43-45 WORTH STREET, NEW YORK

CARVER-BEAVER YARN CO.

Successors to A. D. SALKELD & BRO., Inc.
ALL NUMBERS COTTON MERINO **YARNS** ALL COLORS WOOL WORSTED
366 BROADWAY, NEW YORK

STENCILS

FOR COTTON SHIPPERS, COTTON MILLS, MERCHANTS & MANUFACTURERS - ALSO BRUSHES, INK, MARKING POTS
RUBBER STAMPS, NOTARIAL, CORPORATION SEALS
ATLANTA RUBBER STAMP & STENCIL WORKS
OFFICE 33 LUCKIE ST. WORKS: 350 EDGEWOOD AVE.
P.O. BOX 854 OLDEST STENCIL AND STAMP HOUSE IN GEORGIA ATLANTA, GA.

ANDROSGOGGIN MILLS
BATES MANUFACTURING CO.
BOSTON DUCK CO.
COLUMBIAN MFG. CO.
CORDIS MILLS
EDWARDS MFG. CO.
OTIS COMPANY
PALMER MILL
PEPPERELL MFG. CO.
THORNDIKE CO.
WARREN COTTON MILLS
OTIS CO.—UNDERWEAR

EACH OF THESE MILLS REPRESENTS AN AVERAGE OF 72 YEARS' EXPERIENCE IN THE MANUFACTURE OF DEPENDABLE COTTON FABRICS.

THEIR PRODUCTS ARE SOLD THROUGHOUT THE WORLD BY

BLISS, FABYAN & COMPANY

BOSTON NEW YORK CHICAGO

Tolar, Hart & Holt Mills

Fayetteville, N. C.

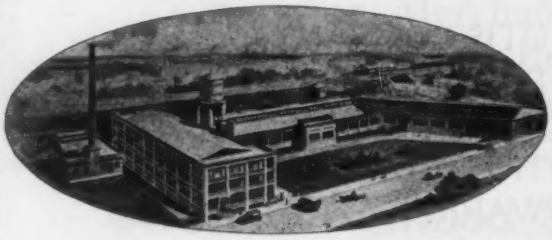
Hosiery Yarns 20s to 30s on cones

FOR NIFTY KNITTING
DOUBLE CARDED
STELLA 30'S
FROM THE CONE TO THE KNITTING MACHINE

TOLAR & HART

New York and Philadelphia

Selling Agents



View of Our Mercerizing and Bleaching Plant

BOGER & CRAWFORD

MAIN PLANT Philadelphia, Pa.

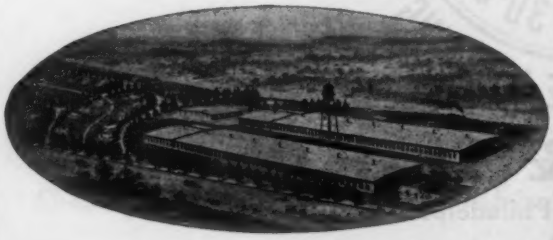
SPINNING MILL Lincolnton, N. C.

As we stand on the threshold of our Fifteenth Year, we take this opportunity to express our sincere appreciation of the support and co-operation by the trade.

Through this means we have been able to grow and expand, thus affording our customers and friends the benefits of our greatly increased facilities.

Because of this fact and the loyal support of our staff of experienced workers, we are able to offer our friends far better service than ever before.

ROBERT C. BOGER
ALFRED CRAWFORD



Spinning Mills, Lincolnton, N. C.

Callaway Mills

INCORPORATED

345 Madison Avenue

Phone—Murray Hill 7801

NEW YORK

SELLING AGENTS
Unity Cotton Mills
Milstead Manufacturing Co.
Elm City Cotton Mills
Manchester Cotton Mills
Hillside Cotton Mills
Unity Spinning Mills
Villa Rica Cotton Mills
Athens Manufacturing Co.

Boston Representative
M. R. ABBOTT
110 Summer Street

Chicago Representative
RAY T. JOHNSON
226 W. Adams Street

ESTABLISHED 1872

H. & B. BEER

NEW ORLEANS

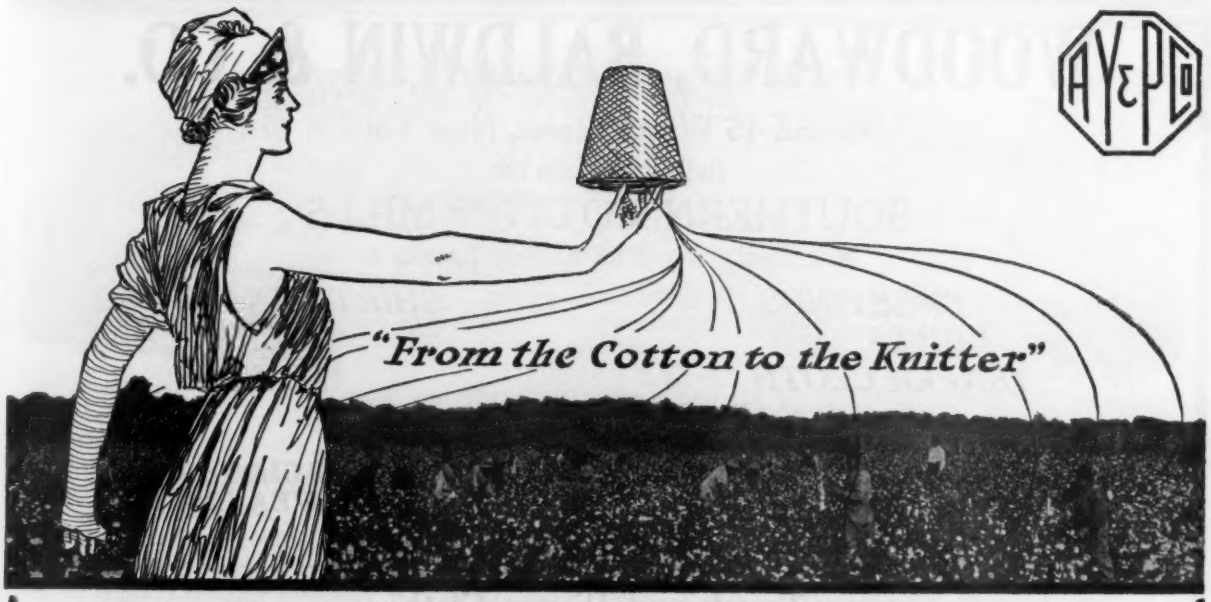
HENRY BEER
J. WILLIAM BARKDULL
EDGAR H. BRIGHT
C. MORGAN ABRAMS

MEMBERS OF

New Orleans Cotton Exchange
New Orleans Future Brokers Association
New York Stock Exchange
New York Cotton Exchange
New York Coffee Exchange
New York Produce Exchange
Chicago Board of Trade

Associate Members of the Liverpool Cotton Association

Private Wires to Principal Points



AMERICAN YARN & PROCESSING CO.
MOUNT HOLLY, N. C.
SPINNERS AND MERCERIZERS
HIGH GRADE COMBED AND CARDED YARNS—16s to 80s
Our Mercerized Yarns Are the Product of Our Own Mills
General Office, Mt. Holly, N. C. Branch Office, 1111 James Bldg., Chattanooga, Tenn.
Representatives
H. B. ROBIE, 346 Broadway, New York City FORREST BROS., Forrest Bldg., Philadelphia

Wellington, Sears & Company
Boston, New York, Chicago, St. Louis, San Francisco
Philadelphia, Atlanta, New Orleans.

Cotton Textile Merchants

Anchor Duck Mills, Rome, Ga.
Brookside Mills, Knoxville, Tenn.
Columbus Mfg. Co., Columbus, Ga.
Dixie Cotton Mills, LaGrange, Ga.
Equinox Mills, Anderson, S. C.
Gluck Mills, Anderson, S. C.
Hamilton Woolen Co., Southbridge, Mass.
Lanett Cotton Mills, West Point, Ga.
New England Bunting Co., Lowell, Mass.
Palmetto Cotton Mills, Palmetto, Ga.
Piedmont Cotton Mills, Egan, Ga.
Samoset Cotton Mills, Talladega, Ala.
Sherman Mfg. Co., Sherman, Tex.
Suncook Mills, Suncook, N. H.
Warwick Mills, Centreville, R. I.
and the mills of the West Point Mfg. Co., West Point, Ga.,
Langdale, Fairfax, Riverdale, Shawmut.

WOODWARD, BALDWIN & CO.

43 and 45 Worth Street, New York

Selling Agents for

SOUTHERN COTTON MILLS

Manufacturing Well Known Brands of

SHEETINGS *SHIRTINGS*
DRILLS *DUCKS*
DIAPER CLOTH *TOWELS*

For Home and Export

ALL WEIGHTS AND CONSTRUCTIONS OF PRINT CLOTHS AND FINE CLOTHS IN PLAIN AND FANCY WEAVES.

Outing Flannel and Romper Cloths
Towels and Diaper Cloths
Pajama Checks

Baltimore **Philadelphia** **Boston**
St. Louis **San Francisco** **Chicago**
St. Joseph **Minneapolis** **Shanghai, China**
St. Paul **Cincinnati**

J. H. LANE & CO.

Tire Fabrics — Cord Fabric
Enamelling Duck — Wide Drill
Sheeting — Osnaburg

Special Constructions
Cotton Fabrics

250 W. 57th St.
NEW YORK

226 West Adams St.
CHICAGO

—SILK—
Oscar Heineman Co.
CHICAGO

SINGLE MERCERIZED
—YARNS—
Southern Mercerizing Co.

SOUTHERN YARN CO.

911 JAMES BUILDING, CHATTANOOGA, TENN.

—SINGLES AND PLY YARNS
OF EVERY DESCRIPTION
DIRECT FROM SPINNERS—

HUGHES FAWCETT

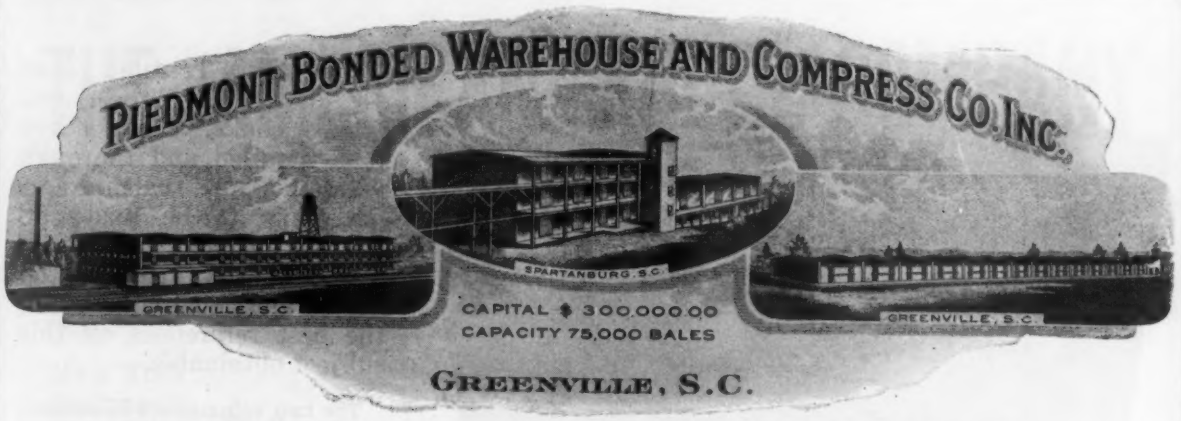
IMPORTER AND COMMISSION MERCHANT

LINEN YARNS
For Weaving, Knitting and all Purposes.

TURKEY RED YARNS
For Towel Borders, Towellings and Bleaching Cloth

Linen Jacquard Harness Twine
And Every Description of Linen Thread and Twine

115 Franklin Street, : NEW YORK



OVER 500,000 bales of cotton are consumed annually within a radius of 50 miles of this Warehouse.

Situated in the midst of the great Cotton Manufacturing district of the Carolinas.

Facilities for distributing Mill Cotton are unsurpassed.

Have re-shipping privileges, without additional cost, from all points throughout the Cotton States, South and West of Atlanta, Georgia.

Its receipts are well and favorably known to all Southern, Eastern and Western Banks.

Warehouses are protected with Sprinkler System, which guarantees best insurance rates.

Our rates for services rendered patrons are reasonable.

For further information, apply to

C. T. TURNER, Manager, Greenville, S. C.

Cooper & Griffin

INCORPORATED

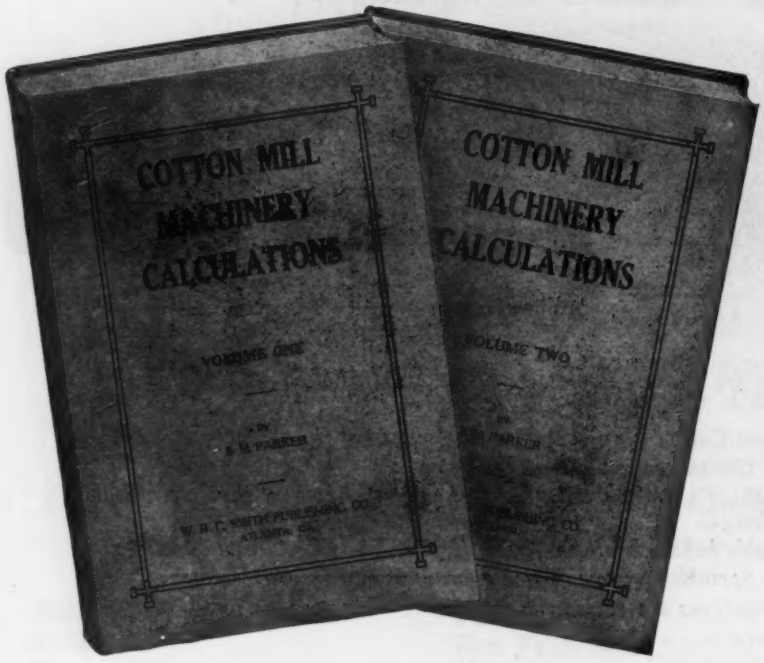
HEAD OFFICE

Greenville, S. C.

COTTON

—BRANCHES—

Spartanburg, S. C.	Sumter, S. C.	Toccoa, Ga.
Anderson, S. C.	Atlanta, Ga.	Charlotte, N. C.
Seneca, S. C.	Savannah, Ga.	Norfolk, Va.



EVERY Textile Man should have these reference books. They cover in a detailed and thorough manner all calculations necessary to be made on any cotton mill machinery manufactured in the United States and constitute one of the best references on this subject obtainable.

The two volumes are illustrated with 45 diagrams and contain 21 reference tables.

As the value of a book lies in its contents and not in a fancy cover, we have put these two volumes out in a strong, serviceable paper binding. You can secure them in conjunction with a subscription to COTTON.

Write for circulars and full information.

ALL ABOARD

Winter Excursion Fares And All Year Tourist Fares

—TO—

Alabama	Georgia	North Carolina
Arizona	Havana	Oregon
Arkansas	Kentucky	South Carolina
British Columbia	Louisiana	Tennessee
California	Mississippi	Texas
Florida	New Mexico	Virginia
Washington		West Virginia

—VIA—

Georgia Railroad

Atlanta & West Point R. R.

Western Railway of Alabama

Liberal time limit and stop-over privileges.
For further information apply to

J. P. BILLUPS, G. P. A.

714 HEALEY BUILDING, ATLANTA, GA.

EUROPEAN PLAN

Rooms 600 Baths

Headquarters in Detroit for

OLD COLONY CLUB
DETROIT AUTOMOBILE CLUB

. . DAILY RATES . .

100 at $2.50 Single—$4.50 Double
150 " $3.00 " —$5.00 "
100 " $4.00 " —$6.00 "
50 " $5.00 " —$7.00 "

50 with Twin Beds, $5.00 to $7.00
100 In Suite, $5.00 to $8.00, Double
Two Floors of Agents' Sample Rooms $5.00 per Day
Table d'Hote Dinner. $1.25-$2.00

HOTEL TULLER

Under New Management
CAFETERIA O. C. FROMAN, Mgr. GRILLE
Business Men's Lunch 65c.

THE AMERICAN AUDIT COMPANY

100 BROADWAY, NEW YORK CITY

F. W. LAFRENTZ, C. P. A., President.

H. M. RICE, C. P. A., Vice Pres. A. F. LAFRENTZ, C. P. A., Secy. & Treas.

BRANCHES:

New York	Baltimore	New Orleans	Philadelphia
Richmond	Milwaukee	Scranton	Wilkes-Barre
Washington, D. C.	Atlanta	Boston	Los Angeles
Chicago			London, E. C.

Our Reports of Audits and Our Certificates of Condition and Operations, Are Known and Have Weight in the Financial Centers of the World

ATLANTA BRANCH

1013 Fourth National Bank Building, Atlanta, Ga.

C. B. BIDWELL, C. P. A., Resident Vice President.

ATLANTA'S NEW MILLION DOLLAR HOTEL
POPULAR PRICED

HOTEL CECIL

COFFEE SHOP—ROOF GARDEN

312 ROOMS—FIRE PROOF—312 BATHS
RATES PER DAY, EUROPEAN PLAN

	ONE PERSON	TWO PERSONS
22 ROOMS AND BATH	$1.50	
104 ROOMS AND BATH	2.00	$3.00
104 ROOMS AND BATH	2.50	4.00
53 ROOMS AND BATH	3.00	5.00
14 ROOMS AND BATH	4.00	6.00
8 ROOMS AND BATH TWIN BEDS		5.00
7 ROOMS AND BATH TWIN BEDS		7.00

H. R. and C. R. CANNON, Proprietors
J. F. deJARNETTE, Manager
OPERATING
GEORGIAN HOTEL, ATHENS, GA. TERMINAL HOTEL, ATLANTA, GA.

OPPORTUNITIES

along the line of the

TEXAS AND PACIFIC RAILWAY

—IN—

TEXAS AND LOUISIANA

For Location of Cotton Mills

The Texas and Pacific Railway serves a number of the most important cotton centers of Texas and Louisiana and traverses the principal cotton producing counties of North Texas and Louisiana.

The State of Texas has only nineteen cotton mills in operation, and is the largest cotton producing State in the Union.

The erection of new mills is being considered by several communities. There is an opportunity for experienced mill men to be associated with the management of these enterprises, if stock is taken.

For particulars, address,

FRANK J. BURKE,

Land and Industrial Commissioner,

DALLAS, TEXAS

CLASSIFIED ADVERTISING

RATES:

DISPLAYED.

"For Sale" and all other advertisements using bold-face type or otherwise displayed, $2.00 per inch per insertion.

Rates for larger spaces furnished on application.

WITHOUT DISPLAY.

"Positions Wanted" 3 cents per word per insertion. Minimum charge 50 cents. Payable in advance.

"Positions Open" and other undisplayed advertisements, 4 cents per word per insertion. Minimum charge $1.00. Payable in advance.

(*When replies are to be received in our care, allow four words for box address.*)

New and Second Hand

ENGINES

Corliss Automatic and Slide Valve

BOILERS

Pumps, Hoisting Engines, Gas and Gasoline Engines.

MACHINE TOOLS

Lathes, Planers, Shapers, Drill Presses, etc.

WOOD WORKING

Planers, Molders, Band Saws, etc.

ELEC. MACHINERY

Dynamos and Motors

AND SUPPLIES OF ALL KINDS

FRANK TOOMEY, Inc.,

127-31 N. Third St.

Philadelphia, - Pennsylvania

Well established Manchester House open to represent shippers of Low Grade Cotton, Cotton Pickings and Linters, on commission basis. First class references. "Z. K. 308," c/o Deacon's, Leadenhall St., London, England.

Position Wanted

Mechanical Engineering graduate, 24, experienced in Engineering Work pertaining to cotton mills, desires perpament position as Engineering Assistant to Superintendent or Chief Engineer. Southern mill preferred. Available January 1st. Address M. E., care COTTON, Atlanta, Ga.

WANTED—Position as Yarn Mill Superintendent. I have had over eight years' experience as overseer of carding with one concern, and am thoroughly familiar with spinning, but I would like to have a position as superintendent. I have finished a textile course with the International Schools. Address Box C, care COTTON.

FOR SALE

The following machinery, all in good condition, will be for sale by February 1st. Can be inspected while running up to that time.

16—(12 Gang) No. 50 Universal Doublers—Total Spindles 204—Equipped for 3 ply.

2—(New) No. 160 Doublers—50 Spindles each—Equipped for 5 ply.

6—Universal Winding Super Cone Machines Model 80—Total Spindles 72.

1—Foster Cone Winder Model 30—100 Spindles.

14—Fine Twisters, 264 Spindles each—2" ring, 3" gauge, band driven—8 of these can be used for wet twist.

18—Draper Twisters, 100 Spindles each—4½" ring, 5½" gauge, band driven. 8000 New Spools for same.

12—Jack Speeders, 224 Spindles each. Self Balanced Rail 6 x 2½; 4¼" Space.

For appointment to see this Machinery Write

Utica Spinning Company, Inc.
Utica, New York

WANTED—Position as Master Mechanic. I have had experience as master mechanic and chief engineer in some of the more prominent cotton mills of the South, extending over a period of a number of years. Can furnish best of references as to ability, character, etc. Shall be glad to hear from any mills interester. Address Box D, care COTTON.

Do You Want to Sell It?

Probably you, like many other mills, have some equipment or machinery which you have taken out, or are thinking of taking out and replacing with new equipment.

Why not dispose of this second-hand equipment at a profit? COTTON is read by thousands of Cotton Mills that are hardly touched by Northern journals.

You Can Sell Your Second-Hand Equipment

to these mills through advertising in the Classified Advertising Section of COTTON. Such advertising produces results at small cost—why not try it out and get that second-hand equipment off your hands in a profitable way? Tell us what you have for sale and let us insert an advertisement for you.

COTTON

Grant Bldg., Atlanta, Ga.

MACHINERY BARGAINS

for Textile Mills

The Nashville Industrial Corporation, purchasers of the $87,000,000 Old Hickory Powder Plant, has released a large amount of machinery for immediate sale, a large portion of which is very desirable for use in textile plants. None of this equipment was in use over 90 days, and while in practically new condition it is offered at second-hand prices.

Special Bulletins covering various kinds of equipment will be sent on request.

A few of the many offerings:

PUMPS.

8—14-in. Worthington Class B, double suction, 8500 G.P.M. at 152 ft. head, at 1170 R.P.M., direct connected to 300 hp. G.E., 3 phase, 60 cycle, 2200 volt motors.

4—14-in. Allis-Chalmers, Type S, 7500 G.P.M. at 130 ft. heat at 1760 R.P.M., direct connected to 300 h.p. General Electric, 3 phase, 60 cycle, 2200 volt motors.

2—10-in. Allis-Chalmers, Type S, 3750 G.P.M. at 130-ft. head at 1765 R.P.M., direct connected to 150 h.p. Westinghouse 3 phase, 60 cycle, 2200 volt motors.

6—16-in. Allis-Chalmers, Type S, 8500 G.P.M. at 90-ft. head, direct connected to Type L, 300 h.p., 2000 R.P.M. G.E. Curtis steam turbine.

6—14-in. Allis-Chalmers, Type S, 6500 G.P.M. at 150-ft. head, 8100 G.P.M. at 90-ft. head, direct connected to 300 h.p. 2000 R.P.M. G.E. Curtis steam turbine.

1—20 x 12 x 16 Worthington duplex Underwriters fire pump, 1500 G.P.M., 100 lb. pressure.

200—New and used simplex and duplex, steam driven, Worthington pumps, 4½x3¾x4, 5½x4¾x5, 6x4x6, 7½x4½x10, 6x2½x6.

100—New and used belted 2½", 3", 5", 5", and 6" centrifugal pumps.

Bulletin No. 8 gives complete specifications of all Pumps.

BLOWERS.

2—18-in. Type C. American Electric Exhaust Fans.
10—18-in Buffalo Electric Disc Exhaust Fans.
6—24-in. Buffalo Electric Disc Exhaust Fans, Emerson Motors.
28—24-in. Buffalo Electric Disc Exhaust Fans, E. S. C. Motors.
64—30-in. Buffalo Electric Disc Exhaust Fans, Emerson Motors.
18—30-in. Buffalo Electric Exhaust Fans, Sprague Motors.
5—No. 1 Buffalo Baby Conoidal Fans, Emerson Motors
4—No. 2 Buffalo Baby Conoidal Fans, Emerson Motors.
4—No. 3 Buffalo Baby Conoidal Fans, Emerson Motors.
15—No. 4 Buffalo Baby Conoidal Fans, Emerson Motors.
All the above equipped with standard A.C. Motors.

BLOWERS—continued.

5—No. 3 Buffalo Niagara Conoidal Fans.
10—No. 4½ Buffalo Niagara Conoidal Fans.
25—No. 6 Buffalo Niagara Conoidal Fans.
15—No. 7 Buffalo Niagara Conoidal Fans.
1—No. 9 Buffalo Niagara Conoidal Fan.
10—No. 4 Buffalo "B" Volume Blowers.
5—No. 5 Buffalo "B" Volume Blowers.
2—No. 6 Buffalo "B" Volume Blowers.
5—No. 8 Buffalo "B" Volume Blowers.
10—No. 1 Low Pressure Gas Exhausters.
10—30-in. Buffalo Standard Reversible Mill Exhausters.
25—50-in. Buffalo Standard Reversible Mill Exhausters.
10—No. 4 24-in. Buffalo Steel Pressure Blowers.
7—Roots Style D, High Pressure Type Blowers, capacity 890 cu. ft. per minute.
2—Connersville Blowers, capacity 3,200 cu. ft. per minute.

Write for Bulletin No. 11 giving complete specifications.

TRANSMISSION.

Thousands of pulleys, including pressed steel, split cast iron and solid cast iron, ranging in diameter from 6 to 56 inches, and in width from 2 to 32 inches, are included with the material at Old Hickory.

Also hundreds of tons of cold rolled shafting up to six inches in diameter, pillow blocks, drop hangers, ring-oiling, capillary and standard bearings, flange couplings, ribbed couplings, grim death couplings, wall brackets, floor stands, pillow block frames, friction clutches, cut-off couplings, sleeves, collars, etc.

We can supply complete line shafts or any transmission equipment needed. Write for Bulletin No. 15.

TANKS.

1500—New and used steel Tanks, small sizes. Mixing tanks, storage tanks, boiling tanks, pressure tanks, and open tanks.
2000—Wood tanks. All sizes.
Hydro-Extractors, Cotton Washers and Dryers, Mixing Pickers, Rinsers, etc.
Electrical Supplies of all kinds.

Write for Catalogues.

NASHVILLE INDUSTRIAL CORPORATION

JACKSONVILLE, TENN.

Buyers' Index

ACETYLENE GAS.
Commercial Acetylene Supply Co.
Oxyeld Acetylene Co.
Standard Gas Products Co.

ACETYLENE WELDING APPARATUS.
(See Welding Apparatus.)

ACIDS.
(See Dyestuff and Chemicals.)

ACCOUNTANTS.
American Audit Co.
Ernst & Ernst.

ACCOUNTING SYSTEMS.
Ernst & Ernst.

ADDING MACHINES.
Monroe Calc. Mch. Co.

AERATING AND CLEANING MACHINE.
Murray Company, The.

AIR WASHERS.
Bayley Mfg. Co.
Buckeye Blower Co.
Carrier Eng. Corp.
Grinnell Co.
Parks-Cramer Co.

AIR COMPRESSORS.
(See Compressors.)

AIR CONDITIONING SYSTEMS
(See Humidifying Apparatus.)

ALBONE.
Roessler & Hasslacher Chemical Co.

ALKALIES.
(See Dyestuffs and Chemicals.)

ALUM.
(See Finishing and Sizing Materials.)

ANILINE COLORS.
(See Dyestuffs and Chemicals.)

ANTI-CHLORINE.
(See Dyestuffs and Chemicals.)

ANTI-CHLORINE ACID GENERATOR.
Macomb Machine Co.

APRONS—RUB.
Bond Co., Chas.
Smith & Furbush Machine Co.

ARCHITECTS AND ENGINEERS.
Lockwood, Greene & Co.
Robert & Co.
Sirrine, J. E.
Stuhrman, Edw. A.
Thompson & Binger, Inc.

ARTWORK.
Jacobs & Co.

ASH HANDLING MACHINERY.
(See Coal Handling Machinery.)

ASPHALT SLATE SHINGLES.
(See Slate Asphalt Roofing.)

ASPIRATORS.
Beiger Co.

AUDITORS AND ACCOUNTANTS.
American Audit Co.
Ernst & Ernst.

AUTO TRUCKS.
(See Trucks—Auto.)

AUTOMATIC CONTROLLERS (TEMPERATURE).
(See Temperature Controllers.)

AUTOMATIC LOOM ATTACHMENTS.
(See Loom Attachments.)

AUTOMATIC FEEDS FOR COTTON.
Brooks & Doxey, Ltd.
Lord Bros.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Sargent's Sons Corp., C. G.
Smith & Furbush Mch. Co.
Whitin Mch. Works.

AUTOMATIC SCALES.
(See Scales.)

AUTOMOBILES.
White Co.

BACKWASHERS.
Sargent's Sons Corp., C. G.

BAROMETERS.
Taylor Instrument Co.

BALL BEARINGS.
Aldrich Mch. Works.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.

BALL BEARING HOUSINGS.
Aldrich Machine Works.
Fafnir Bearing Co.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.

BALE BAND BUCKLES.
(See Box Strapping & Buckles.)

BALE OPENERS.
(See Openers.)

BALING MACHINES.
Brooks & Doxey, Ltd.
Crompton & Knowles Loom Wks.
Draper Corporation.
Economy Baler Co.
Logemann Bros.
Lord Bros.
Rex Eng'g Corp.
Saco-Lowell Shops.

BALING PRESSES.
(See Presses.)

BANDAGES, TAPES, ETC.
American Textile Banding Co.
Weimar Bros.

BANDAGE & TAPE MACHINES.
Foster Machine Co.
Whitin Mch. Wks.

BANDS.
(See Tapes.)

BANDS (HOSIERY LABELS AND STICKERS).
Kirby-Cogeshall Co.

BANKS.
National Shawmut Bank.

BARRELS—FIBRE.
(See Fibre Products.)

BASKETS—MILL.
(See Boxes—Mill.)

BATH CABINET—SHOWER.
Crane Co.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

BATTERIES (ELEC.)
(See Storage Batteries.)

BEAMS.
Allen Co.
Mossberg Pressed Steel Corp.
U. S. Bobbin & Shuttle Co.

BEAM DYEING MACHINES.
Brandwood, John.
Cocker Mch. & Fdry. Co.

BEAM HEADS.
Allen Co.
Jordan Mfg. Co.
Mossberg Pressed Steel Corp.
U. S. Bobbin & Shuttle Co.

BEAMING AND WARPING MACHINERY.
(See Warpers and Warping Machinery.)

BEARINGS.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
Renold, Inc., Hans.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.
Wood's Sons Co., T. B.

BELTING (LEATHER, CANVAS AND RUBBER).
American Supply Co.
Bond Co., Chas.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

BELTING—CHAIN.
Link-Belt Company.
Morse Chain Co.
Renold, Inc., Hans.

BELTING (ROUND—LEATHER).
Bond Co., Chas.
Rhoads & Sons, J. E.

BELTING—ROPE.
(See Rope Transmission.)

BELT CONVEYORS.
Dodge Sales & Eng. Co.
Link-Belt Company.
Morse Chain Co.

BELT DRESSING.
Bond Co., Chas.
Dixon Crucible Co., Jos.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

BELT LACING.
Bond Co., Chas.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

BELT TIGHTENERS.
Link-Belt Company.
Rhoads & Sons, J. E.
Wood's Sons Co., T. B.

BENCH DRAWERS.
Lupton's Sons Co., David.

BENCH LEGS (PRESSED STEEL).
Lupton's Sons Co., David.

BENCHES (PARK AND PLAYGROUND).
(See Playground Equipment.)

BLEACHERIES.
(See Dyers, Bleachers and Finishers.)

BLEACHING KIERS.
Butterworth & Sons Co., H. W.
Cocker Mch. & Fdry. Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Machry. Co.
Woolford Wood Tank Co., G.

BLEACHING MACHINERY.
(See Dyeing, Bleaching and Finishing Machinery.)

BLEACHING, FINISHING AND SIZING MATERIALS.
(See Finishing Materials.)

BLOWERS AND BLOWER SYSTEMS.
Bayley Mfg. Co.
Buckeye Blower Co.
Carrier Eng. Corp.
General Electric Co.
Philadelphia Drying Mchry. Co.
Westinghouse Elec. & Mfg. Co.

BOARDS—FIBRE.
Keystone Fibre Co.

BOARDS—FORM.
Pearson, Jos. T.

BOBBINS.
Draper Corporation.
Jordan Mfg. Co.
Lestershire Spool & Bobbin Co.
Parker Co., Walter L.
Shambow Shuttle Co.
Vermont Spool & Bobbin Co.
U. S. Bobbin & Shuttle Co.
Whitin Machine Works.

BOBBIN HEADS.
Allen Co.
Jordan Mfg. Co.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.

BOBBIN STRIPPERS.
Crompton & Knowles Loom Works.

BOILERS.
Casey-Hedges Co.
Cole Mfg. Co., R. D.
International Engineering Wks., Inc.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
Schofield's Sons Co., J. S.
Toomey, Frank.
Walsh & Weidner Boiler Co.

BOILER COMPOUNDS.
Dixon Crucible Co., Jos.

BOILER FEED WATER PURIFICATION.
American Water Softener Co.
Casey-Hedges Co.
Norwood Engineering Co.
Scaife & Sons, Wm. B.

BOILER ROOM FITTINGS AND SUPPLIES.
Casey-Hedges Co.
Crane Co.
Dixon Crucible Co., Jos.
Godfrey Conveyor Co.
International Engineering Co.
Jenkins Bros.
Lunkenheimer Co.
Nashville Industrial Corp.

BOILER GRATES AND STOKERS.
(See Grates and Stokers.)

BOOKKEEPING MACHINES.
Monroe Calc. Mch. Co.

BOX STRAPPING AND TIE BUCKLES.
(See Banding Straps and Buckles.)

BOXES—MILL.
Hightower Box & Tank Co.
Keystone Fibre Co.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
Standard Fibre Co.
Walke Box Co.

BOXES—PACKING.
(See Packing Boxes.)

BRAID.
(See Tapes.)

BRAZING.
(See Welding.)

BRICK (PAVING AND FLOOR)
National Paving Brick Co.

BROKERS—COTTON.
(See Cotton Dealers & Brokers.)

BROKERS—STOCK.
(See Stocks and Bonds.)

BROOMS.
(See Brushes.)

BROOMS—REFILLABLE.
Re-Fil-It Broom Mfg. Co.

BRUSHES—MILL.
Atlanta Brush Co.
Re-Fil-It Broom Mfg. Co.
Southwestern Broom Mfg. Co.

BRUSHES—MOTOR AND GENERATOR (COMMUTATOR).
Dixon Crucible Co., Jos.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

BUCKETS AND PAILS—MILL.
Standard Fibre Co.

BUCKETS—ELEVATOR AND GRAB.
Link-Belt Company.

BUCKLES—COTTON TIE.
(See Box Strapping and Ties.)

BUILDING CONTRACTORS.
(See Contractors.)

BUILDINGS (ALL STEEL).
Truscon Steel Co.

BUILDING MATERIAL.
Anchor Post Iron Works.
Barrett Co., The
Birmingham Slag Co.
Dixie Portland Cement Co.
Dufur & Co.
Hough Shade Corp.
Knapp Fence Co.
Lupton's Sons Co., David.
National Paving Brick Co.
Sanymetal Products Co.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.
Truscon Steel Co.
Walker Electric & Plb. Co.
Ware Paint Co.

BURR PICKERS.
Sargent's Sons, C. G.
Smith & Furbush Mach. Co.

BUSHINGS.
Dodge Sales & Eng. Co.
Southern Spindle & Flyer Co.

BUSINESS METHODS.
Ernst & Ernst.

CABINETS.
(See Lockers.)

CALCULATING MACHINES.
Monroe Calculating Mch. Co.

CALENDERS.
Butterworth & Sons Co., H. W.
Monaghan, Jas. F.
Textile Finishing Mchry. Co.

CALENDER ROLLS.
(See Rolls—Calender.)

CALLING SYSTEM—INTERTELEPHONE.
Carter Electric Co.

CAMLESS DETACHING DEVICES.
Beiger Co.

CANS—ROVING.
Keystone Fibre Co.
Standard Fibre Co.

CANS (DRYING).
(See Drying Equipment.)

CARS AND TRUCKS—FIBRE.
(See Trucks.)

CARBONIZING MACHINERY.
Grinnell Co.
Klauder-Weldon Dyeing Machine Co.
Macomb Machine Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sargent's Sons & Co., C. G.
Textile Finishing Mchry. Co.
Tolhurst Mch. Works.

CARDING MACHINERY AND SUPPLIES.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.

CARD CLOTHING.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

CARD FEEDS.
Brooks & Doxey, Ltd.
Lord Bros.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Co.

CARD GRINDING MACHINERY
Smith & Furbush Mach. Co.
Whitin Machine Works.

CARPET MACHINERY.
Butterworth, H. W. & Sons Co.
Crompton & Knowles Loom Works.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Schofield, Wm., Co.
Smith & Furbush Mach Co.
Textile Finishing Mchry. Co.

CARRIER APRONS.
(See Aprons.)

CARRIER SYSTEM.
Curtis Pneumatic Machry. Co.

CASES—WOODEN.
(See Boxes.)

CASTINGS.
Briggs, Shaffner Co.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdry. & Mch. Co.
Walsh & Weidner Boiler Co.

CAUSTIC SODA.
(See Bleaching Materials.)

CEMENT.
Dixie Portland Cement Co.

CEMENT REINFORCEMENT.
Birmingham Slag Co.
Truscon Steel Co.

CEMENT AND BRICK COATING.
American Cement Paint Co.
Dixon Crucible Co., Jos.
Hockaday Co.
Wadsworth, Howland & Co., Inc.
Ware Paint Co.

CENTRAL STATION (ELECTRIC).
Alabama Power Co.
Georgia Railway & Power Co.
Tennessee Power Co.

CENTRIFUGALS.
Cresson-Morris Co.
Fletcher Works.
Goulds Mfg. Co.
Schaum & Uhlinger.
Tolhurst Mch. Wks.

CHAIN DRIVES.
(See Belting—Chain Link.)

WRITE US
for catalog on
other
Mill Receptacles.

No-Waste
SEAMLESS ROVING CANS

Waste Baskets
Taper Baskets
Oval Cans
Elliptical Cans

Sizes
9"-10"-11"-12"-14"-18"
diameters
and
up to 45" high

NO
seams, joints,
or
Rivets.

Styles

Polished
Steel
or
Rolled Fibre
Top Rims
Rings
BEADED
securely
to
Hard Fibre
Shells.

Hard Fibre
MILL BARRELS
Plain Fibre
and
NEW PATTERN
Steel Clad
Trucks and Boxes
Combination
Doffing Cars

STANDARD FIBRE CO.
Somerville, Massachusetts

A Happy New Year

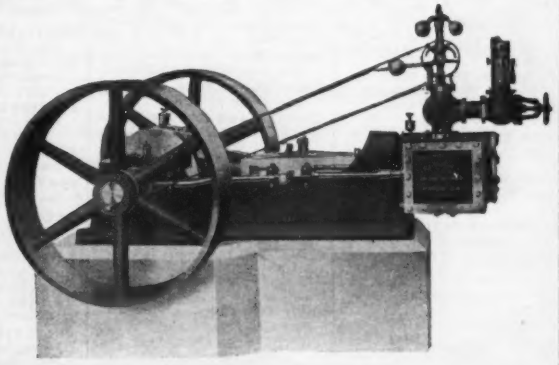
is starting for all who use

SAVOGRAN

Its reputation is built on results.
A real cleaner for mills.

"Ask Your Supply House."

INDIA ALKALI WORKS
Established since 1875
BOSTON, MASS.



J. S. Schofield's Sons Co.
Macon, Georgia
MANUFACTURERS OF
High Pressure Return Tubular
Boilers, High Grade Stationary
Steam Engines, Tanks, Stacks,
Stand Pipes.
Heavy Castings and Wrought
Iron Works.

BUYERS' INDEX—Continued.

CHAIN—BLOCK, BICYCLE, AUTO, ENGINE, AGRICULTURAL, ETC.
Link Belt Co.
Morse Chain Co.
Renold, Inc., Hans.

CHAIRS AND STOOLS.
(See Furniture—Mill.)

CHECK STRAPS.
Bond Co., Chas.
Hayes Loom Reed & Harness Co.
Jacobs Mfg. Co., E. H.

CHEMICALS.
(See Dyestuffs and Chemicals.)

CHLORINE GAS.
Electro Bleaching Gas Co.
Mathieson Alkali Works, Inc.

CLEANING AND AERATING MACHINE FOR COTTON.
Murray Company, The.

CLEARER CLOTH.
Philadelphia Felt Co.

CLOCKS—HANK, ETC.
(See Counters.)

CLOCKS (TIME).
Silberberg, Mortimer J.

CLOCKS—WATCHMAN.
Foxboro Co., Inc.

CLOSETS—WATER.
(See Toilets.)

CLOTH—ROLLER, CLEARER, SLASHER.
Philadelphia Felt Co.

CLOTH CUTTERS.
Firsching, J. A.
Foster Machine Co.
Wildman Mfg. Co.

CLOTH REELS.
Gallaudet Aircraft Corp.

CLOTH ROOM MACHINERY.
Brooks & Doxey, Ltd.
Butterworth, H. W., & Sons Co.
Firsching, J. A.
Foster Machine Co.
Grinnell Co.
Hopedale Mfg. Co.
Lord Bros.
Saco-Lowell Shops.
Textile Finishing Mchry. Co.
Williams Co., J. H.
Wildman Mfg. Co.

CLOTH SHRINKING MACHINERY.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Tolhurst Mch. Wks.

CLOTH TESTERS.
Scott Co., Henry L.

CLOTH WINDERS.
(See Winders.)

CLUTCHES—FRICTION.
Allis-Chalmers Mfg. Co.
Carlyle-Johnson Machine Co.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Link-Belt Company.
Mason, Volney W.
Wood's Sons Co., T. B.

CLUTCH LININGS.
Carlye-Johnson Mch. Co.

COAL AND ASH HANDLING MACHINERY.
Godfrey Conveyor Co.
Link-Belt Company.

COAL TAR DISINFECTANTS
(See Disinfectants.)

COCKS.
(See Valves.)

COLOR PAILS.
(See Buckets—Mill.)

COMB APRONS.
(See Aprons.)

COMBERS AND COMBER SUPPLIES.
Belger Co.
Foster Machine Co.
U. S. Bobbin & Shuttle Co.
Whitin Machine Wks.

COMMISSION MERCHANTS & DEALERS.
(See Cotton Cloth Commission Merchants.)

COMPRESSORS—AIR, GAS, ETC.
Allis-Chalmers Mfg. Co.
Curtis Pneumatic Mchry. Co.
General Electric Co.
Goulds Mfg. Co.

COMMUTATOR BRUSHES.
(See Brushes—Motor and Generator.)

CONCRETE REINFORCEMENT.
Birmingham Slag Co.

CONDENSERS.
Allis-Chalmers Mfg. Co.

CONDUITS.
(See Elec. Machinery & Supplies.)

CONE (KNITTING YARN).
Foster Mch. Co.

CONE WINDING MACIHNE.
(See Winding Machinery.)

CONNECTORS—FRANKEL SOLDERLESS.
Westinghouse Elec. & Mfg. Co.

CONSULTING ENGINEERS
(See Architects and Engineers)

CONTRACTORS AND ENGINEERS—BUILDING.
Foundation Co.
Sirrine & Co., J. E.
Stuhrman, Edw. A.
Thompson & Binger, Inc.
Truscon Steel Co.

CONTRACTORS—ELECTRICAL.
(See Electrical Engineers.)

CONTRACTORS (HEATING & PLUMBING.)
Walker Electric & Plb. Co.

CONTROLLING INSTRUMENTS—TEMPERATURE.
Foxboro Co., Inc.
General Electric Co.
Mates-Brown Co., B. P.
Taylor Instrument Co.

CONVEYORS—BELT.
(See Belt Conveyors.)

CONVEYING MACHINERY.
American Supply Co.
Chisholm-Moore Mfg. Co.
Collins, J. D.
Cresson-Morris Co.
Curtis Pneumatic Mchry. Co.
Godfrey Conveyor Co.
Link-Belt Co.
Mason, Volney W.
Morse Chain Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Renold, Hans.
Schofield, Wm., Co.

CONVEYORS—PORTABLE.
Link-Belt Co.

COOLERS.
(See Humidifying Apparatus.)

COOLERS—WATER.
(See Water Coolers.)

COOLING AND CONDITIONING MACHINES.
Grinnell Co.

COOLING TOWERS.
(See Tanks and Towers.)

COPPER STAMPS AND STENCILS.
(See Stamps, Stencils, etc.)

CORDAGE MACHINERY.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co., The.

COST SYSTEMS.
Ernst & Ernst.

COTTON CLEANING AND AERATING MACHINE.
Murray Company, The.

COTTON YARN AND CLOTH COMMISSION MERCHANTS AND DEALERS.
Aberfoyle Mfg. Co.
Bliss, Fabyan & Co.
Boger & Crawford.
Callaway Mills.
Carver-Beaver Yarn Co., Inc.
Cooper & Griffin.
Fawcett, Hughes.
Florsheim, H. A.
Hunter Mfg. & Comm. Co.
Lane & Co., J. H.
Southern Yarn Co.
Tolar & Hart.
Weimar Bros.
Wellington, Sears & Co.
Woodward, Baldwin & Co.

COTTON MERCHANTS AND BROKERS.
Beer & Co., H. & B.
Cooper & Griffin.

COTTON MILL MACHINERY AND SUPPLIES.
Allen Co.
Atlanta Harness & Reed Mfg. Co.
Auto Creel Corp
Barber-Colman Co.
Belger Co.
Brooks & Doxey, Ltd.
Butterworth & Sons, H. W.
Crompton & Knowles Loom Works.
Draper Corporation.
Durant Mfg. Co.
Eclipse Textile Devices, Inc.
Firsching Co., J. A
Fletcher Works.
Foster Machine Co.
Foxboro Co., Inc.
Gallaudet Aircraft Corp.
Greist Mfg. Co.
Grinnell Co.
Hayes Loom Reed & Harness Co.
Hopedale Mfg. Co.
Howard & Bullough.
Hunt Machine Co., Rodney.
Jacobs Mfg. Co., E. H.
Keystone Fibre Co.
Lestershire Spool & Mfg. Co.
Lord Bros.
Lowell Crayon Co.
Mates-Brown Co., Inc., B. P.
Mossberg Pressed Steel Corp.
Parker Co., Walter L.
Phila. Drying Mchry. Co.
Philadelphia Felt Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield Co., Wm.
Shambow Shuttle Co.
Stafford Co.
Steel Heddle Mfg. Co.
Suter, Alfred.
Terrell Machine Co.
Textile Finishing Machinery Co.
Tolhurst Mch. Wks.
Universal Winding Co.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.
Washburn & Sons, L. R.
Williams Co., J. H.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

COTTON STORAGE WAREHOUSE.
Piedmont Bonded Warehouse & Compress Co.

COTTON TAPE LOOM.
Fletcher Works.
Foster Mch Co.
Schaum & Uhlinger.

COTTON YARN MILLS.
(See Yarn Manufacturers.)

COUNTERS—REVOLUTION, HANK, PICK, ETC.
Durant Mfg. Co.
Foxboro Co.

COUNTERS—RESTAURANT.
(See Restaurant Equipment.)

COUPLING—SHAFT.
Cresson-Morris Co.
Wood's Sons Co., T. B.

COVERING—ROLLER.
Bond Co., Chas.
Philadelphia Felt Co.

CRANES.
(See Hoists.)

CRAYONS.
Lowell Crayon Co.

CREELS
Auto Creel Corp.
Suter, Alfred.
Warp Compressing Co.

CREOSOTED FLOORING, BLOCKS, POSTS, SHINGLES, ETC.
Southern Wood Preserving Co.

CULVERTS.
Dixie Culvert & Metal Co.

CUTS FOR PRINTING.
Jacobs & Co.

CUTTERS—CLOTH.
(See Cloth Cutters.)

CUTTERS—THREAD.
(See Thread Cutters.)

DELIVERY CASES.
(See Boxes—Packing.)

DESKS—FACTORY.
Lupton's Sons Co., David.

DEXTRINES.
See Dyestuffs and Chemicals.)

DIAL SCALES.
(See Scales.)

DIES—STEEL.
(See Stamps, Stencils, Etc.)

DIE STOCKS.
(See Pipe Threaders.)

DISINFECTANTS.
Barrett Co., The.

DOBBY CHAINS.
Crompton & Knowles Loom Wks.
Whitin Machine Works.

DOBBY CARDS.
Jacobs Mfg. Co., E. H.

DOFFING BOXES—MILL.
(See Boxes—Mill.)

DOFFING CARS.
(See Cars.)

DOORS—STEEL.
Lupton's Sons Co., David.

DOUBLING MACHINERY.
Brooks & Doxey, Ltd.
Lord Bros.

DRAWINGS AND ARTWORK.
Jacobs & Co.

DRAINAGE ENGINEERS.
Dixie Culvert & Metal Co.

DRAWING FRAMES.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Whitin Machine Works.

DRILLS—ELECTRIC.
(See Electric Machinery.)

DRINKING FOUNTAINS.
(See Fountains—Drinking.)

DROP WIRES.
Draper Corp.
Greist Mfg. Co.
Mossberg Pressed Steel Corp.
Steel Heddle Mfg. Co.
Williams Co., J. H.

DRYING APPARATUS.
Bayley Mfg. Co.
Buckeye Blower Co.
Grinnell Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.

DRYING FORMS—HOSIERY.
Pearson, Jos. T.

DRYING MACHINERY AND EQUIPMENT.
American Laundry Mchry. Co.
Butterworth, H. W., & Sons Co.
Cocker Mch. & Fdry. Co.
Grinnell Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp, C. G.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.

DUST COLLECTORS.
(See Blowers and Blowing Systems.)

DUSTING MACHINERY.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

DYERS, BLEACHERS AND FINISHERS.
American Yarn & Processing Co.
Boger & Crawford.
Dixie Mercerizing Co.
Franklin Process Co.
Sayles Finishing Plants, Inc.
United Piece Dye Wks.

DYEING, BLEACHING, FINISHING AND PRINTING MACHINERY AND EQUIPMENT.
American Laundry Mchry. Co
Brandwood, John.
Butterworth & Sons Co., H. W.
Cocker Mch. & Fdry. Co.
Cole Mfg. Co., R. D.
Electro Bleaching Gas Co.
Firsching, J. A.
Fletcher Works.
Franklin Process Co.
Grinnell Co.
Hauser-Stander Tank Co.
Hunt Machine Co., Rodney.
Klauder-Weldon Dyeing Mch. Co.
Macomb Machine Co.
Monaghan, Jas. F.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Schaum & Uhlinger.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.
Woolford Wood Tank Co., G.

DYEING MACHINES (PACKAGE AND SPOOL).
Brandwood, John.
Franklin Process Co.

DYE STICKS.
Phila. Drying Machinery Co.

DYE VATS AND TUBS.
(See Tanks or Bleaching Kiers)

DYESTUFFS AND CHEMICALS.
Arnold, Hoffman & Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Central Dyestuff & Chemical Co.
Ciba Co., Inc.
Electro Bleaching Gas Co.
Ford Co., J. B.
Grasselli Chemical Co.
India Alkali Works.
Kali Mfg. Co.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Mates-Brown Co., Inc., B. P.
Metz & Co., H. A.
National Aniline & Chemical Co.
Roessler & Hasslacher Chemical Co.
Rohm & Hass Co.
Sandoz Chemical Co.
Sonneborn Sons, Inc., L.
Staley Mfg. Co., A. E.
Stein, Hall & Co.
Surpass Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques.

EFFICIENCY ENGINEERS.
Sherman Service, Inc.

ELECTRIC CONDUIT AND FITTINGS.
(See Electrical Machinery and Supplies.)

ELECTRIC DYNAMOS AND MOTORS.
(See Motors and Generators.)

ELECTRIC FANS.
(See Fans—Electric.)

ELECTRIC LAMPS.
(See Lamps.)

ELECTRIC LAMP GUARDS.
Flexible Steel Lacing Co.
Ivanhoe Regent Works.

ELECTRICAL ENGINEERS AND CONTRACTORS.
Curtis, Paul W.
Huntington & Guerry, Inc.
Ivanhoe Regent Works.
Walker Electric & Plbg. Co.

ELECTRIC LIGHTING ENGINEERS.
(See Illuminating Engineers.)

ELECTRICAL MACHINERY AND SUPPLIES.
Allis-Chalmers Mfg. Co.
Bayley Mfg. Co.
Blake Electric Mfg. Co.
Carter Electric Co.
Cooper Hewitt Electric Co.
Curtis, Paul W.
Cutter Works, George.
Federal Electric Co.
General Electric Co.
Ivanhoe-Regent Works.
Mason, Volney W.
Walker Electric & Plbg. Co.
Walsh & Weidner Boiler Co.
Westinghouse Elec. & Mfg. Co.

ELECTRIC POWER.
(See Power.)

ELECTRIC PRESSES (HIGH PRESSURE).
Rex Eng'g Corp.

ELECTRIC TRACTORS AND TRUCKS.
(See Tractors and Trucks—Electric.)

ELECTROTYPES.
Jacobs & Co.

ELEVATORS—PORTABLE.
Collins, J. D.

ELEVATORS.
Link-Belt Company.

ENAMELED IRON AND GLASS FOR TEXTILE MACHRY.
Mitchell-Bissell Co.

ENAMEL—MILL WHITE.
(See Paint.)

ENGINEERS—MILL.
(See Architects.)

ENGINES—OIL, GAS AND GASOLINE.
Allis-Chalmers Mfg. Co.

ENGINES (STEAM).
Allis-Chalmers Mfg. Co.
Cole Mfg. Co., R. D.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
Schofield's Sons Co., J. S.
Toomey, Frank.

ENGINE ROOM APPLIANCES AND SUPPLIES.
Casey-Hedges Co.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.
Westinghouse Elec. & Mfg. Co.

ETCHING—(PRINTING).
Jacobs & Co.

ENGRAVING AND CUTS.
Jacobs & Co.

EXPORTERS—COTTON.
(See Brokers.)

EXTRACTORS—HYDRO.
American Laundry Mchry. Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.

FACTORY DESKS.
Lupton's Sons Co., David.
Manufacturing Equip. & Eng'g Co.

Pat. Applied for

SPUR-CAP SHELLS

Made to Stand the Hard Knocks

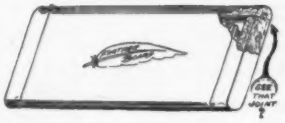
MANUFACTURED BY

GALLAUDET AIRCRAFT CORP'N.,

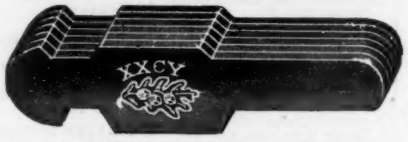
EAST GREENWICH, R. I.

FEATHERBOARD

The Master Cloth Reel



LIGHT AND STRONG. IMPROVES YOUR PUT UP.



"JACOBS" XXCY DOLL PICKER

COTTON LOOM SIZE AND DUCK LOOM SIZE

Only pure oak bark tanned leather is used in this quality of picker, and it is treated by a secret process, giving a maximum of resiliency in the cushion or body where the shuttle strikes, which, it can be readily seen, represents the vital point of value in a loom picker.

The construction of this picker commends itself strongly. We should like to send all the samples you can use.

A Complete Line of "Jacobs" Loom Supplies Carried in Stock by all the Largest Supply Houses.

E. H. JACOBS MANUFACTURING COMPANY
DANIELSON, CONN.

Morehead
~~Back to Boiler~~
SYSTEM

Better Drainage

You are assured better drainage and decreased fuel costs with the Morehead Back-to-Boiler System draining your steam heated equipment and returning the condensation direct to your boilers.

Morehead Manufacturing Company
Dept. C, Detroit, Michigan.

(53)

The American Audit Co.

F. W. LAFRENTZ, C. P. A., Pres.
H. M. RICE, C. P. A., Vice-Pres. A. F. LAFRENTZ, C. P. A., Secy. & Treas.
NEW YORK—100 Broadway (Home Office).
33rd St. and 5th Ave., (Waldorf-Astoria).
ATLANTA BRANCH—1013-1017 4th National Bank Bldg.
CHICAGO—Marquette Building.
BOSTON—P. O. Square Bldg.
PHILADELPHIA—Colonial Trust Bldg.
BALTIMORE—Garrett Bldg.
WASHINGTON, D. C.—Colorado Bldg.
NEW ORLEANS—Maison Blanche.
RICHMOND, VA.—American National Bank Building.
MILWAUKEE—Loan & Trust Bldg.
SCRANTON—County Bank Bldg.
WILKES BARRE, PA.—Odd Fellows Bldg.
LOS ANGELES, CAL.—Herman W. Hellman Bldg.
KNOXVILLE, TENN.—American National Bank Bldg.
LONDON, E. C.—50 Gresham St., Bank.

Specialties in Cost Systems and Manufacturing Accounts.
ATLANTA BRANCH
C. B. BIDWELL, C. P. A., Resident Vice-President

CORTRIGHT
METAL SHINGLES

Why hand-dipped shingles are better

After being cut and stamped out of tin plate the shingles are dipped in a size bath receiving a heavy coating on both sides and *on all edges.*

CORTRIGHT *Philadelphia* METAL ROOFING CO. *Chicago*

STANDARD SINCE 1887

ALL STEEL ECONOMY FIRE PROOF BALING PRESSES
ALL SIZES FOR ALL PURPOSES
LARGEST LINE BUILT IN U.S.A.
ECONOMY BALER CO., DEPT C ANN ARBOR, MICH., U.S.A.

WATER

WE-FU-GO AND SCAIFE
PURIFICATION SYSTEMS
SOFTENING & FILTRATION
FOR BOILER FEED AND
ALL INDUSTRIAL USES
WM. B. SCAIFE & SONS CO. PITTSBURGH, PA.

BUYERS' INDEX—Continued.

FACTORY & INDUSTRIAL SITES.
Alabama Power Co.
Georgia Ry. & Power Co.
Tennessee Power Co.
Texas & Pacific Ry.
Nashville Industrial Corp.

FACTORY MANAGEMENT SYSTEMS.
Ernst & Ernst.

FANS—ELECTRIC.
Bayley Mfg. Co.
Buckeye Blower Co.
Carter Electric Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

FANS—CONVEYING, POWER AND EXHAUST.
(See Blowers and Blowing Systems.)

FASTENERS—BELT.
(See Belt Fasteners.)

FEED WATER PURIFIERS.
(See Boiler Feed Water Purification.)

FEEDERS.
(See Automatic Feeders.)

FELT CLOTH FOR ROLLS.
Philadelphia Felt Co.

FELTING MACHINERY.
Smith & Furbush Mch. Co.

FENCE—STEEL AND IRON.
Anchor Post Iron Works.
Knapp Fence Co.

FENCE POSTS—CREOSOTED PINE.
Southern Wood Preserving Co.

FIBRE PRODUCTS.
Keystone Fibre Co.
Standard Fibre Co.

FILLING—CAP AND WARP.
U. S. Bobbin & Shuttle Co.

FILLING STATION PUMPS.
Bowser & Co., S. F.

FILTERS—WATER.
American Water Softener Co.
Norwood Engineering Co.
Scaife & Sons Co., Wm. B.

FILTERS—OIL REMOVAL.
Norwood Engineering Co.

FILTERS (ALUM).
Lennig & Co., Chas.

FINISHING.
(See Dyers, Bleachers and Finishers.)

FINISHING, BLEACHING AND SIZING MATERIALS.
Arnold, Hoffman & Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Central Dyestuff & Chemical Co.
Ciba Co., Inc.
Corn Products Refining Co.
Electro Bleaching Gas Co.
Electric Smelting & Aluminum Co.
Ferd Co., J. B.
India Alkali Works.
Kali Mfg. Co.
Keever Starch Co.
Lennig & Co., Chas.
Mates-Brown Co., Inc., B. P.
Mathieson Alkali Works, Inc.
Metz & Co., H. A.
National Aniline & Chemical Co.
Roessler & Hasslacher Co.
Rohm & Haas Co.
Sandoz Chemical Co.
Sonneborn Sons, Inc., L.
Staley Mfg. Co., A. E.
Stein, Hall & Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

FIRE DOORS AND HARDWARE.
Lupton Sons Co., David.
Sanymetal Products Co.
Truscon Steel Co.

FIRE EXTINGUISHERS.
Grinnell Co.

FIRE HOSE.
(See Hose—Fire.)

FIRE PROTECTING PAINT.
(See Paint.)

FLAX SPINNING.
U. S. Bobbin & Shuttle Co.

FLEXIBLE COUPLINGS.
Allis-Chalmers Mfg. Co.
Cresson-Morris Co.

FLOOD LIGHTS—ELECTRIC.
Cooper Hewitt Electric Co.
General Electric Co.

FLOORING LUMBER.
Hightower Box & Tank Co.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

FLOORING (TILE & BRICK).
National Paving Brick Co.

FLOORING—WOOD BLOCKS.
Southern Wood Preserving Co.

FLOOR SCRUBBING MACHINE
American Scrubbing Equipment Co.

FLOOR SCRUBBING POWDERS.
(See Scrubbing Powders.)

FLOOR SWEEPS.
(See Brushes.)

FLUTED ROLLS.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Schofield & Sons, J. S.
Smith & Furbush Mach. Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.

FLYERS.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

FOUNDERS.
Briggs-Shaffner Co.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdy. & Mch. Wks.

FOUNTAINS—DRINKING.
Crane Co.
Manufacturing Equip. & Eng'g Co.
Miles Refrigerating Co.
Rundle-Spence Mfg. Co.
Taylor, Halsey W.

FRICTION CLUTCHES.
(See Clutches—Friction.)

FURNITURE—MILL.
Allen Co.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.

FUSES—ELECTRIC.
Carter Electric Co.
Federal Electric Co.

GARNETT MACHINES.
Smith & Furbush Mch. Co.

GAS ENGINES.
(See Engines—Gas.)

GASOLINE PUMPS AND STORAGE TANKS.
Bowser & Co., S. F.

GAUGE (YARN CLEANER).
Mates-Brown Co., Inc., B. P.

GAUGES—STEAM PRESSURE, ETC.
Foxboro Co., Inc.
Taylor Instrument Co.

GAUGE—OIL.
Lunkenheimer Co.

GAUGES—WATER.
Lunkenheimer Co.

GEARS—SILENT.
General Electric Co.
Link-Belt Company.
Morse Chain Co.
Renold, Hans.

GEAR CUTTING AND CUTTERS.
Cresson-Morris Co.

GEAR PULLERS.
General Electric Co.

GENERATORS—ELECTRIC.
(See Motors and Generators.)

GLASSWARE AND DISHES.
(See Dishes.)

GOVERNORS—PUMP.
General Electric Co.

GRAPHIC CHARTS.
Ernst & Ernst.

GRAPHITE.
Dixon Crucible Co., Jos.

GRATES—BOILER.
Cole Mfg. Co., R. D.
International Eng. Works.
Lombard Fdry. & Mch. Co.
Walsh & Weidner Boiler Co.

GRATES—MECHANICAL.
(See Stokers.)

GREASE.
(See Lubricants.)

GREASE CUPS.
(See Lubricators.)

GRINDER—CARD, CYLINDER, ROLL, NAPPER AND GARNET.
(See Card Grinding Machinery.)

GUARDS—ELECTRIC LAMP.
(See Electric Lamp Guards.)

GUARDS — MACHINE, SKYLIGHT, WINDOW, ETC.
Anchor Post Iron Works.
Knapp Fence Co.

GUIDES—THREAD.
Mitchell-Bissell Co.
Palmer Co., L. E

GUMS.
(See Finishing and Sizing Materials.)

HALFTONES—PRINTING.
Jacobs & Co.

HANGERS.
(See Shafting and Hangers.)

HANK CLOCKS.
(See Counters.)

HARDWARE—BUILDING.
Sanymetal Products Co.

HARNESS—LOOM.
American Supply Co.
Atlanta Harness & Reed Mfg. Co.
Crompton & Knowles Loom Works.
Emmons Loom Harness Co.
Greist Mfg. Co.
Garland Mfg. Co.
Hayes Loom Reed & Harness Co.

HEADS—BOBBIN AND SPOOL.
Allen Co.
Lestershire Spool & Bobbin Co.
Parker Co., Walter L.
U. S. Bobbin & Shuttle Co.

HEATERS.
Bayley Mfg. Co.

HEATING AND VENTILATING APPARATUS.
(See Ventilating Apparatus.)

HEATING & PLUMBING CONTRACTORS.
Walker Electric & Plbg. Co.

HEDDLES.
Crompton & Knowles Loom Works.
Draper Corporation.
Steel Heddle Mfg. Co.
Williams Co., J. H.

HEDDLE FRAMES.
Crompton & Knowles Loom Works.
Steel Heddle Mfg. Co.
Williams Co., J. H.

HOISTS.
Chisholm Moore Mfg. Co.
Curtis Pneumatic Mchry. Co.
Link-Belt Company.
Mason, Volney W.
Morse Chain Co.

HOPPER FEEDERS.
(See Automatic Feeders.)

HOSE—FIRE.
Collins, J. D.

HOSIERY DYEING MACHINERY.
Cole Mfg. Co., R. D.
Franklin Process Co.
Philadelphia Drying Mchry. Co.

HOSIERY FORMS.
(See Drying Forms.)

HOSIERY LABELS, BANDS, STICKERS, ETC.
Kirby-Cogeshall Co.

HOSIERY PACKING.
Kirby-Cogeshall Co.

HOSIERY YARNS.
(See Yarn Manufacturers.)

HOTELS.
Hotel Cecil.
Hotel Martinique.
Hotel Tuller.

HUMIDIFYING APPARATUS.
American Moistening Co.
Bayley Mfg. Co.
Carrier Eng. Corp.
Grinnell Co.
Mates-Brown Co., B. P.
Parks-Cramer Co.

HUMIDIFYING INDICATING INSTRUMENTS.
Mates-Brown Co., B. P.
Taylor Instrument Co.

HYDGRODEIKS.
Taylor Instrument Co.

HYGROMETERS.
Foxboro Co.
Mates-Brown Co., B. P.
Taylor Instrument Co.

HYDRAULIC TURBINES.
(See Turbines—Hydraulic.)

HYDRO EXTRACTORS.
(See Extractors.)

ICE MACHINES.
Miles Refrigerating Co.

ILLUMINATING ENGINEERS.
Curtis, Paul W.
Huntington & Guerry.
Ivanhoe-Regent Works.

INDICATING AND RECORDING INSTRUMENTS AND THERMOMETERS.
Durant Mfg. Co.
Foxboro Co., Inc.
General Electric Co.
Taylor Instrument Co.

INDIGO.
(See Dyestuffs and Chemicals.)

INDUSTRIAL SITES.
Alabama Power Co.
Georgia Ry. & Power Co.
Nashville Industrial Corp.
Tennessee Power Co.
Texas & Pacific Ry.

INDUSTRIAL COORDINATION SERVICE.
Sherman Service, Inc.

INJECTORS.
Lunkenheimer Co.

INK—STENCIL AND MARKING.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

IRON WORK—ORNAMENTAL.
Anchor Post Iron Works.
Dufur & Co.
Knapp Fence Co.
Lombard Iron Works & Supply Co.
Royal Metal Mfg. Co.

JACK SPOOLS.
(See Spools.)

JACQUARDS.
Crompton & Knowles Loom Works.

JOINT COMPOUND.
Dixon Crucible Co., Jos.

JUTE BAGGING MACHINE.
Smith & Furbush Machine Co.

KETTLES—SIZE.
(See Size Kettles.)

KETTLES—SODA.
Lombard Iron Works & Supply Co.

KIERS.
(See Bleaching Kiers.)

KNIT GOODS.
(See Cotton Cloth Commission Merchants and Dealers.)

KNIT GOODS WASHERS.
(See Washers—Cloth.)

KNITTING MACHINERY AND SUPPLIES.
Brinton Co., H.
General Machine Works.
Hemphill Mfg. Co.
Kirby-Cogeshall Co.
Scott & Williams.
Torrington Co.
Trump Bros. Machine Co.
Wildman Mfg. Co.

KNITTING NEEDLES.
Torrington Co.

LABELS FOR HOSIERY, BOXES, ETC.
Kirby-Cogeshall Co.

LABORATORY INSTRUMENTS.
Scott & Co., Henry L.
Foxboro Co., Inc.
Taylor Instrument Co.

LACING—BELT.
(See Belt Lacing.)

LAMPS—INCANDESCENT AND ARC.
Carter Electric Co.
Cooper Hewett Electric Co.
Curtis, Paul W.
Cutter Works, George.
General Electric Co.
Ivanhoe-Regent Works of G. E. Co.
Walker Electric & Plbg. Co.
Westinghouse Elec. & Mfg. Co.

LAMP GUARDS—KEY LOCKING.
(See Electric Lamp Guards.)

LAMP REFLECTORS.
Carter Electric Co.
Cooper Hewitt Electric Co.
Curtis, Paul W.
Cutter Works, George.
Grinnell Co.
Ivanhoe-Regent Works of G. E. Co.
Walker Electric & Plbg. Co.
Westinghouse Elec. & Mfg. Co.

LANDSCAPE ARCHITECTS.
(See Village Architects.)

LAPPERS.
Brooks & Doxey, Ltd.
Lord Bros.
Saco-Lowell Shops.
Smith & Furbush Mch. Co.
Whitin Machine Works.

LAUNDRY MACHINERY.
American Laundry Mchry. Co.
Fletcher Works.
Hunt Machine Co., Rodney.
Schaum & Uhlinger.
Tolhurst Machine Works.

LAVATORIES.
Crane Co.
Manufacturing Equip. & Eng'g Co.
Vogel Co., Jos. A.

LEATHER BELTING.
(See Belting.)

LEATHER SPECIALTIES.
American Supply Co.
Bond Co., Chas.
Jacobs Mfg. Co., E. H.
Williams & Sons, I. B.

LIGHTS—FLOOD.
Cutter Works, George.
Cooper Hewitt Electric Co.
General Electric Co.
Ivanhoe-Regent Works.
Westinghouse Elec. & Mfg. Co.

LIGHTING ENGINEERS AND CONTRACTORS.
(See Illuminating Engineers.)

LINEN YARNS.
(See Yarns Linen.)

LINK BELTING.
(See Belting—Link.)

LINTERS.
(See Waste Dealers.)

LIQUID CHLORINE.
(See Chlorine.)

LOADERS—WAGON AND TRUCK.
Link-Belt Company.

LOCKERS—METAL.
Collins, J. D.
Lupton Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g. Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.

LOGWOOD EXTRACT.
(See Dyestuffs and Chemicals.)

LOOMS.
Compton & Knowles Loom Works.
Draper Corporation.
Fletcher Works.
Hopedale Mfg. Co.
Saco-Lowell Shops.
Schaum & Uhlinger.
Stafford Co.

LOOM ATTACHMENTS—AUTOMATIC.
Draper Corporation.
Hopedale Mfg. Co.

LOOM HARNESS.
(See Harness.)

LOOP PICKERS.
Jacobs Mfg. Co., E. H.

LUBRICANTS.
D-A Lubricant Co.
Dixon Crucible Co., Jos.
Lamson Oil Co., Inc.
Masury-Young Co.
N. Y. & N. J. Lubricant Co.
Texas Co.

LUBRICATORS.
Bowser & Co., S. F.
Lunkenheimer Co.
N. Y. & N. J. Lubricant Co.

LUG STRAPS.
(See Straps—Lug.)

LUMBER.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

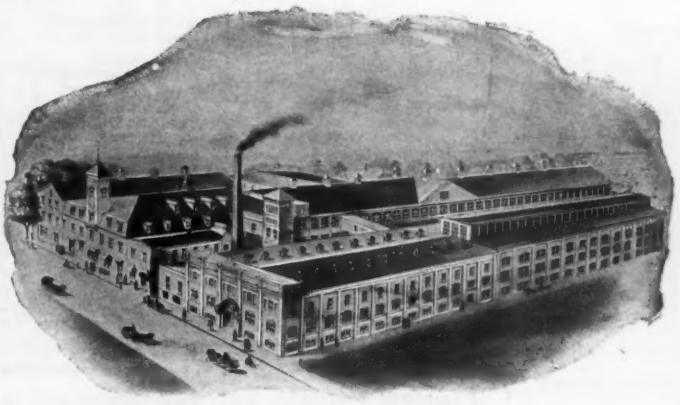
LUNCH ROOM EQUIPMENT.
(See Restaurant.)

MACHINE GUARDS.
Anchor Post Iron Works.
Knapp Fence Co.

MACHINE TOOLS.
(See Tools.)

This Big Plant Is Working For YOU

and is always ready to supply you with the best quality COTTON HARNESS, MAIL HARNESS, SELVEDGE HARNESS, REEDS, SLASHER AND STRIKING COMBS, WARPER AND LIECE REEDS, BEAMER AND DRESSER HECKS, MENDING EYES, JACQUARD HEDDLES, ETC.



Submit your requirements to us for prices.

Remember, QUALITY is inbuilt in every EMMONS Product that leaves our factory.

EMMONS LOOM HARNESS CO., LAWRENCE, MASS.
Largest Manufacturers of Loom Harness and Reeds in America
SOUTHERN REPRESENTATIVE: GEO. F. BAHAN.

EMMONS LOOM HARNESS AND REEDS

Make 1923 a Year of More Profits

with

"REMOVOIL"

The Oil Stain Remover

If you are not using "Removoil" to eliminate the seconds in your mill, there is no better time than NOW to start on the road to reduced losses from this source.

Just a few drops of "Removoil" on an oil stain, and with a little rubbing the oil stain vanishes. No trouble—does not injure the finest or most delicate fabrics. If the goods are going direct to the bleach, no rubbing is necessary as the stain is removed in the bleach.

Let "Removoil" effect the same savings in your mill that it is making in mills all over the country.

We want to send you a trial order. We are sure you will be more than pleased with "Removoil."

May we hear from you?

"Our Success Represents Confidence Won by Integrity."

MASURY-YOUNG CO.

Established 1857. **Boston, Mass.**

BUYERS' INDEX—Continued.

MACHINISTS.
Briggs-Shaffner Co.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdry. & Mch. Works.

MARKING POTS, STENCILS, INKS, ETC.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

MERCERIZED YARNS.
(See Yarn Manufacturers).

MERCERIZERS.
Aberfoyle Mfg. Co.
Amer. Yarn & Processing Co.
Boger & Crawford.
Dixie Mercerizing Co.
Sayles Finishing Plant, Inc.

MERCERIZED YARN.
Aberfoyle Mfg. Co.
American Yarn & Pro. Co.
Boger & Crawford Co.
Dixie Mercerizing Co.
Hunter Mfg. & Comm. Co.
Sayles Finishing Plant, Inc.
United Piece Dye Wks.

MERCERIZING MACHINERY.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

METAL CEILINGS, ETC.
Lupton's Sons Co., David.
Truscon Steel Co.

METALS—PERFORATED.
(See Screens and Sieves.)

METERS—FLOW, AIR, GAS, ELECTRIC, STEAM, ETC.
Allis-Chalmers Mfg. Co.
Carter Electric Co.
Foxboro Co., Inc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

METERS—COUNTING.
(See Counters.)

MILL BASKETS AND BOXES.
(See Boxes—Mill.)

MILL ENGINEER.
(See Architects and Engineers.)

MILL VILLAGES.
(See Villages.)

MILL SUPPLIES—MISCELLANEOUS.
(See Supplies—Mill.)

MILL WHITE PAINT.
(See Paint.)

MOPS.
Atlanta Brush Co.
Southwestern Broom Mfg. Co.

MOTION PICTURES.
(See Films.)

MOTORS AND GENERATORS—ELECTRIC.
Allis-Chalmers Mfg. Co.
Carter Electric Co.
Curtis, Paul W.
General Electric Co.
Nashville Industrial Corp.
Walker Electric & Plbg. Co.
Westinghouse Elec. & Mfg. Co.

MOVING PICTURE MCH. AND SUPPLIES.
(See Theatre Equipment.)

NEEDLES—KNITTING.
Torrington Co.

OFFICE EQUIPMENT & SUPPLIES.
Carter Electric Co.
Jacobs & Co.
Knapp Fence Co.
Lupton's Sons Co., David
Monroe Calculating Mch. Co.
Royal Metal Mfg. Co.
Smith & Bros. Typewriter Co.
Sanymetal Products Co.

OFFICE PARTITIONS.
(See Partitions.)

OIL—LUBRICATING.
D-A Lubricant Co.
Johnson & Co., Inc., Oliver.
Lamson Oil Co., Inc.
Masury-Young Co.
Texas Co.
Wadsworth, Howland & Co., Inc.

OIL ENGINES.
(See Engines Oil.)

OILS—FINISHING.
(See Finishing and Sizing Materials.)

OIL CUPS.
(See Lubricators.)

OIL PAPER.
Bradley Mfg. Co., A. J.

OIL SEPARATORS.
(See Separators.)

OIL STORAGE TANKS AND PUMPS.
Bowser & Co., S. F.

OILING DEVICES.
(See Lubricators.)

OPENING MACHINERY—COTTON, WOOL, WASTE, ETC.
Brooks & Doxey, Ltd.
Lord Bros.
Murray Company, The.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

OVERHEAD CARRIERS.
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Mchry. Co.

OXIDIZING MACHINERY.
Phila. Drying Machinery Co.

OXYGEN.
Bird-Potts Co., Inc.
Commercial Acetyene Supply Co.
Oxweld Acetylene Co.
Standard Gas Products Co.

PACKING BOXES AND CASES—WOODEN.
Hauser-Stander Tank Co.
Hightower Box & Tank Co.
Lewis Co., G. B.
Walks Box Co., Inc.

PACKINGS.
Jenkins Bros.

PAINT.
American Cement Paint Co.
Barrett Co., The.
Dixon Crucible Co., Jos.
Hockaday Co.
Johnson & Co., Oliver.
Wadsworth, Howland & Co., Inc.
Ware Paint Co.

PAINTING CONTRACTORS.
(See Contractors.)

PANEL BOARDS.
(See Switchboards.)

PAPER.
Bradley Mfg. Co., A. J.

PARTITIONS—STEEL AND WIRE.
Anchor Post Iron Works.
Knapp Fence Co.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

PERBORATE OF SODA.
Roessler & Hasslacher Chemical Co.

PERFORATED METAL.
(See Screens and Sieves.)

PEROXIDES.
Roessler & Hasslacher Chemical Co.

PICK COUNTERS.
(See Counters.)

PICKERS—CURLED HAIR.
Schofield Co., Wm.
Smith & Furbush Machine Co.

PICKERS—LEATHER.
Bond Co., Chas.
Garland Mfg. Co.
Jacobs Mfg. Co., E. H.

PICKER LOOPS.
Jacobs Mfg. Co., E. H.

PICKER STICKS.
Garland Mfg. Co.

PICKING MACHINERY.
Brooks & Doxey, Ltd.
Howard & Bullough Am. Machine Co.
Lord Bros.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

PINIONS.
General Electric Co.

PIPE—STEEL RIVETED.
Youngstown Sheet & Tube Co.

PIPE AND PIPE FITTINGS.
Crane Co.
Grinnell Co.
Lunkenheimer Co.
Parks-Cramer Co.
Scaife & Sons Co., Wm. B.
Walker Electric & Plbg. Co.

PIPE DRAINAGE.
Dixie Culvert & Metal Co.
Youngstown Sheet & Tube Co.

PIPE JOINT COMPOUND.
Dixon Crucible Co., Jos.

PIPING—COTTON.
Youngstown Sheet & Tube Co.

PIPING ENGINEERS.
Grinnell Co.
Walker Electric & Plbg. Co.

PIPE BENDING.
Grinnell Co.
Youngstown Sheet & Tube Co.

PIPING (POWER, PROCESS.)
Grinnell Co.

PLAYGROUND APPARATUS & EQUIPMENT.
Crane Co.
Manufacturing Equip. & Eng'g. Co.
Royal Metal Mfg. Co.
Rundle-Spence Mfg. Co.
Taylor, Halsey W.

PLUMBING & HEATING CONTRACTORS.
Walker Electric & Plbg. Co.

PNEUMATIC MACHINERY & TOOLS.
Curtis Pneumatic Mchry. Co.

PORCELAIN GUIDES.
Mitchell-Bissell Co.

PORTABLE CONVEYORS.
(See Conveyors.)

POSTS—FENCE (WOOD.)
Southern Wood Preserving Co.

POWER—ELECTRIC.
Alabama Power Co.
Georgia Ry. & Power Co.
Tennessee Power Co.

POWER TRANSMISSION.
Aldrich Machine Works.
Allis-Chalmers Mfg. Co.
Bond Co., Chas.
Brown Co., A. & F.
Carlyle-Johnson Mch. Co.
Cresson-Morris Co.
Dixon Crucible Co., Jos.
Fafnir Bearing Co.
General Electric Co.
Grinnell Co.
Hyatt Roller Bearing Co.
Link-Belt Company.
Morse Chain Co.
Renold, Inc., Hans.
Rhoads & Sons, J. E.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.
Westinghouse Elec. & Mfg. Co.
Williams & Sons, I. B.
Wood's Sons Co., T. B.

PRESERVATIVE PAINT FOR METAL WORK.
(See Paints.)

PRESSED STEEL.
Lupton's Sons Co., David.

PRESSES.
American Laundry Mchry. Co.
Butterworth & Sons Co., H. W.
Economy Baler Co.
Logemann Bros. Co.
Phila. Drying Mch. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Rex Eng'g Corp.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co., The.

PRESSURE REGULATORS.
(See Regulators—Pressure.)

PRINTERS (CLOTH).
(See Dyers.)

PRINTING.
Jacobs & Co.
Showalter Printing Co., A. J.

PRINTING EXTRACTORS—HYDRO.
Tolhurst Machine Works.

PULLEYS.
Cole Mfg. Co., R. D.
Dodge Sales & Eng. Co.
Cresson-Morris Co.
Link-Belt Company.
Mason, Volney W.
Renold, Inc., Hans.
Wood's Sons Co., T. B.

PULLEY COVERING.
Williams & Sons, I. B.

PUMPS.
Allis-Chalmers Mfg. Co.
Bowser & Co., S. F.
Gou'ds Mfg. Co.
Sydnor Pump & Well Co., Inc.
Toomey, Frank.
Walsh & Weidner Boiler Co., The.
Westinghouse Elec. & Mfg. Co.

PUMPS—OIL.
Bowser & Co., S. F.
Lunkenheimer Co.

PUMP VALVES.
(See Valve Discs.)

PYROMETERS.
Foxboro Co.
Tay'or Instrument Co.

QUILLS.
Jordan Mfg. Co.
U. S. Bobbin & Shuttle Co.

QUILL CLEANING MACHINES.
Terrell Machine Co.

RAILWAYS.
A. & W. P. Ry.
Central of Ga. Ry.
Georgia Railroad.
Southern Railway System.
Texas & Pacific Ry.

RAW STOCK DRYING SYSTEMS.
Brandwood, John.

RECEPTACLES—FIBRE.
(See Fibre Products.)

RECORDING INSTRUMENTS.
Durant Mfg. Co.
Foxboro Co., Inc.
General Electric Co.
Mates-Brown Co., B. P.
Service Recorder Co.
Taylor Instrument Co.

REEDS.
American Supply Co.
Atlanta Harness & Reed Mfg. Co.
Emmons Loom Harness Co.
Hayes Loom Reed & Harness Co.

REELS.
Crompton & Knowes Loom Works.
Draper Corporation.
Gallaudet Aircraft Corporation.
Hunt Machine Co., Rodney.
Mossberg Pressed Steel Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Whitin Machine Works.

REFLECTORS—LAMPS.
(See Lamp Reflectors.)

REGULATORS—LIQUID LEVEL.
Foxboro Co., Inc.
General Electric Co.

REGULATORS—PRESSURE.
Foxboro Co., Inc.
General Electric Co.
Taylor Instrument Co.

REGULATORS—TEMPERATURE.
(See Temperature Controllers.)

REINFORCING SLAG.
Birmingham Slag Co.

REPAIRING—ELECTRICAL
Briggs-Shaffner Co.
Curtis, Paul W.
Westinghouse Elec. & Mfg. Co.

REPAIRING—TEXTILE MACHINERY, ETC.
Bird-Potts Co., Inc.
Briggs-Shaffner Co.
General Machine Works.
Southern Spindle & Flyer Co.
Standard Gas Products Co.

RESTAURANT EQUIPMENT.
Sanymetal Products Co.

RIBBERS.
(See Knitting Machinery.)

RIB TOP CUTTERS.
General Machine Works.
Wildman Mfg. Co.

RING TRAVELERS—STEEL AND BRONZE.
Whitinsville Spinning Ring Co.
Whitin Machine Works.

RINGS—SPINNING.
(See Spinning Rings.)

ROCKER SHAFT BEARINGS.
(See Bearings.)

ROLLS—CALENDER.
Brooks & Doxey, Ltd.
Butterworth & Sons Co., H. W.
Lord Bros.
Monaghan, Jas. F.
Textile Finishing Mchy. Co.
U. S. Bobbin & Shuttle Co.
Washburn & Sons, L. R.

ROLLS—RUBBER COVERED.
Butterworth & Sons Co., H. W.
Textile Finishing Mchy. Co.
Washburn & Sons, L. R.

ROLLS—STEEL.
Allen Co.
Brooks & Doxey, Ltd.
Butterworth & Sons Co., H. W.
Lord Bros.
Monaghan, Jas. F.
Southern Spindle & Flyer Co.
Textile Finishing Mchy. Co.
U. S. Bobbin & Shuttle Co.
Washburn & Sons, L. R.

ROLLS (WOODEN).
U. S. Bobbin & Shuttle Co.
Washburn & Sons, L. R.

ROLLER CLOTH.
Philadelphia Felt Co.

ROLLER LEATHER.
Bond & Co., Chas.

ROLL TREATING CHEMICAL.
Korite Products, Inc.

ROOFING.
Barrett Co.
Cortright Metal Roofing Co.
Dixie Culvert & Metal Co.
Southern Wood Preserving Co.
Wardsworth, Howland & Co.

ROOF AND CEMENT COATING.
American Cement Paint Co.
Barrett & Co.
Hockaday Co.
Johnson & Co., Inc., Oliver.
Wardsworth, Howland & Co.
Ware Paint Co.

ROPE—TRANSMISSION.
Allis-Chalmers Mfg. Co.
Cresson-Morris Co.
Link-Belt Company.

ROVING CANS.
(See Cans—Roving.)

ROVING MACHINERY.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Whitin Machine Works.

RUBBER STAMPS.
(See Stamps, Stencils, Etc.)

SALTS.
(See Finishing & Sizing Materials.)

SANITARY PRODUCTS
Crane Co.
Dixie Culvert & Metal Co.
Manufacturing Equip. & Eng'g Co.
Rundle-Spence Mfg. Co.
Sanymetal Products Co.
Taylor, Halsey W.
Vogel Co., Jos. A.
Walker Electric & Plbg. Co.

SASH-WINDOW—STEEL.
Lupton's Sons Co., David.
Sanymetal Products Co.
Truscon Steel Co.

SASH OPERATOR.
Drouve Co., G.

SCALE PREVENTER—BOILER.
(See Boiler Feed Water Purification.)

SCREENS—MOVING PICTURE.
Southern Theatre Equip. Co.

SCREENS AND SIEVES—PERFORATED.
Allis-Chalmers Mfg. Co.
Erdle Perforating Co.
Knapp Fence Co.
Link-Belt Company.

SCOURING MACHINERY.
(See Washers—Cloth.)

SCRUBBING MACHINE—FLOOR.
American Scrubbing Equip. Co.

SCRUBBING AND WASHING POWDERS.
Mathieson Alkali Works.
India Alkali Works.
Waren Soap Mfg. Co.

SCUTCHERS.
Brooks & Doxey Co., Ltd.
Lord Bros.
Whitin Machine Works.

SECOND HAND MACHINERY AND SUPPLES.
Nashville Industrial Corp.
Toomey, Frank, Inc.

SELVAGE HARNESS.
(See Harness.)

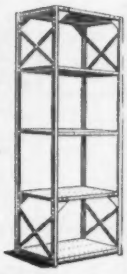
SEWING MACHINES.
Merrow Machine Co., The.
Textile Finishing Mchry. Co.

SHADES—ELECTRIC LAMP.
(See Reflectors.)

SHADES (WINDOW).
Hough Shade Corp.

Steel Shelving

Lupton
INVESTMENT VALUE
PHILADELPHIA



Factory Equipment
From Warehouse Stocks
David Lupton & Sons Co.
Amber St. and Allegheney Ave.
Philadelphia

WOOLFORD BUILT TANKS

They carry our stamp of identification.

G. WOOLFORD WOOD TANK MANUFACTURING COMPANY
Lincoln Building, Philadelphia, Pa.

COTTON MILL REPAIRS

SEND SAMPLES OF PARTS WANTED AND GET OUR PRICES. YOU DON'T HAVE TO BUY.

WE WILL SAVE YOU TIME

AND WON'T EXPECT YOUR ORDER IF WE CAN'T

SAVE YOU SOME MONEY TOO

Briggs-Shaffner Company

WINSTON-SALEM, N. C.

MACHINE WORK **FOUNDRY WORK**

The BANK that is *closest* to the heart of New England Industry

The NATIONAL SHAWMUT BANK *of Boston*

PUMPS

INDUSTRIAL — AGRICULTURAL — MUNICIPAL — RESIDENTIAL

A type for every service.
Bulletins on request.

The Goulds Manufacturing Company
SENECA FALLS, N. Y.

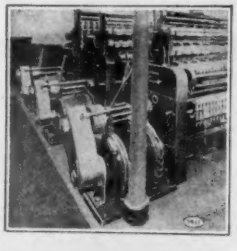
GOULDS

Schofield Patent Automatic Opener and Duster

For opening and dusting Wool, Cotton, Linters, Hair and kindred fibrous substances.

"Schofield" intermediate feeds for Cards, Wool, Rag, Waste, Hair and Lumper Pickers, Automatic, Cone and Oldham Willows, Rag and Extract Dusters, Waste Pullers, Blamaine Lap Feeds, Curled Hair Pickers, Needle Looms, etc.

WILLIAM SCHOFIELD COMPANY
Iron Founders, Textile Machinery Builders.
Krams Ave., Manayunk, Philadelphia, Pa.

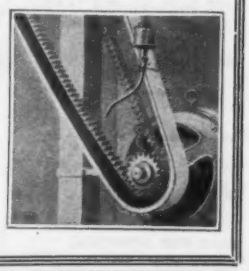


RENOLD CHAINS

For Power Transmission

Montreal HANS RENOLD INC., *Toronto*

365 Broadway, N. Y.



KEEP WATER OUT OF WOOD TO PREVENT ROTTING

Properly used, **Ware Weather Wood Preservative Paint** is guaranteed to make wood, waterproof and weather proof. It greatly prolongs the life of timbers to which it is applied.
Used and recommended by Industrial Plants and Cotton Mills for shingle roofs or wood surfaces and by Counties for Bridge Timbers, etc., where the surface is exposed to weather and wear. Write for further detailed information concerning Stains, Composition Paints, Bridge Paints, Roofing, Roofing Material and other Ware Weather Products.

REPRESENTATIVES:
Georgia and Tennessee, A. W. Beddingfield and C. L. McKissick—Alabama, E. F. Ogburn.

WARE PAINT COMPANY,
ATLANTA, GA.

REPRESENTATIVES:
North Carolina, R. P. Ellis—South Carolina, H. N. Hunt; Florida and Cuba, R. P. Becht.

Ware Weather Wood Preservative Paint
For All Wooden Structures

Ware Weather Metallic Elastic Paint
For All Metal Surface

BUYERS' INDEX—Continued.

SHAFTING AND HANGERS.
Allis-Chalmers Mfg. Co.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Fafnir Bearing Co.
Grinnell Co.
Link-Belt Company.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co.
Wood's Sons Co., T. B.

SHELVING—SECTIONAL STEEL.
Collins, J. D.
Hyatt Roller Bearing Co.
Lupton's Sons Co., David
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.

SHINGLES—ASPHALT.
Barrett Co.

SHINGLES—METAL.
Cortright Metal Roofing Co.

SHINGLES—WOOD.
Southern Cypress Mfg. Assn.
Southern Wood Preserving Co.

SHIPPING ROOM MACHINERY AND SUPPLIES.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Collins, J. D.
Hightower Box & Tank Co.
Royal Metal Mfg. Co.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
Standard Fibre Co.
Walke Box Co., Inc.

SHOWER BATHS AND CABINETS.
Crane Co.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

SHUTTLES.
Crompton & Knowles Loom
Draper Corporation.
Jordan Mfg. Co.
Shambow Shuttle Co.
U. S. Bobbin & Shuttle Co.
Williams Co., J. H.

SIGNS—ELECTRIC.
Federal Electric Co.

SINGEING MACHINERY.
Butterworth & Sons Co., H. W.
Phila. Drying Machine Co.
Textile Finishing Machinery Co., The.

SIREN.
Federal Electric Co.

SITES FOR FACTORIES.
(See Industrial Sites.)

SIZE BOX TEMPERATURE CONTROLLER.
Foxboro Co.

SIZE KETTLES AND TANKS.
(See Bleaching Kiers or Tanks.)

SIZING AND FINISHING COMPOUNDS.
(See Finishing and Sizing Materials.)

SKEWERS.
Jordan Mfg. Co.

SKYLIGHTS.
Lupton's Sons Co., H. W.

SLAG FOR CONCRETE.
Birmingham Slag Co.

SLASHERS AND SLASHER ROOM SUPPLIES.
Allen Co.
Butterworth & Sons Co., H. W.
Cole Mfg. Co., R. D.
Howard & Bullough
Mossberg Pressed Steel Corp.
Monaghan, Jas. F.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

SLASHER CLOTH.
Philadelphia Felt Co.

SLASHER HOODS.
Cole Mfg. Co., R. D.

SLASHER TAPE.
(See Tape—Slasher.)

SLATE ASPHALT ROOFING.
Barrett Co.

SLIDING PARTITION HARDWARE.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Sanymetal Products Co.

SLUBBERS.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Whitin Machine Works.

SMOKE STACKS.
Casey-Hedges Co.

SOAP—TEXTILE.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Ciba Co., Inc.
Electric Smelting & Aluminum Co.
India Alkali Works.
Kali Mfg. Co.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Mates-Brown Co., Inc., B. P.
Rohm & Hass Co.
Sonneborn Sons, Inc., L.
Stein, Hall & Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

SODA—TEXTILE, SODA ASH AND BOILING.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Sonneborn Sons, Inc., L.

SOFTENERS—COTTON.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Bosson & Lane.
Central Dyestuff & Chem. Co.
Ciba Co., Inc.
Ford Co., J. B.
Grasselli Chemical Co.
Kali Mfg. Co.
Lennig & Co., Chas.
Mates-Brown Co., Inc., B. P.
Roessler & Hasslacher Chemical Co.
Rohm & Hass Co.
Sonneborn Sons, Inc., L.
Stein, Hall & Co.
United Chemical Prod. Corp.
Wolf & Co., Jacques.

SOFTENERS—WATER.
(See Water Softeners.)

SOLDERLESS CONNECTORS—FRANKEL.
Westinghouse Elec. & Mfg. Co.

SOLOZONE.
Roessler & Hasslacher Chem. Co.

SOLVENTS.
(See Finishing.)

SPEEDERS.
Jordan Mfg. Co.
Parker & Co., Walter L.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.

SPEEDOMETERS.
(See Counters.)

SPINDLES.
Draper Corporation.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Vermont Spool & Bobbin Co.
Whitin Machine Works.

SPINNERS.
(See Yarn Manufacturers.)
Myrtle Mills, Inc.
Philadelphia Felt Co.
Parkdale Mills, Inc.
Southern Yarn Co.

SPINNING FRAMES.
American Machine Co., H. & B.
Crompton & Knowles Loom Works.
Brooks & Doxey, Ltd.
Davis & Furber Mch. Co.
Howard & Bullough.
Lord Bros.
Schaum & Uhlinger.
Saco-Lowell Shops.
Whitin Machine Works.

SPINNING RINGS.
Brooks & Doxey, Ltd.
Draper Corporation.
Howard & Bullough.
Greist Mfg. Co.
Lord Bros.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

SPINNING TAPE SPECIALISTS.
American Textile Banding Co., Inc.
Barber Mfg. Co.

SPOOLING MACHINERY AND SUPPLIES.
Draper Corporation.
Foster Mch. Co.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.
Warp Compressing Mch. Co.

SPOOLER TENSIONING DEVICE.
Textile Specialty Co.

SPOOLS AND SKEWERS.
Jordan Mfg. Co.
Lestershire Spool & Mfg. Co.
Mossberg Pressed Steel Corp.
Parker Co., Walter L.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.

SPRINKLER SYSTEMS.
Grinnell Co.

SPRINKLER TANKS.
(See Tanks, Towers, Etc.)

SPROCKETS.
Link-Belt Company.
Morse Chain Co.
Renold, Inc., Hans.

SPUR CAP SHELLS.
Gallaudet Aircraft Corporation

STAMPS, STENCILES AND STENCIL MACHINES.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

STAND PIPES.
(See Tanks.)

STARCH AND GUMS.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Bosson & Lane.
Ciba Co.
Corn Products Refining Co.
Kali Mfg. Co.
Keever Starch Co.
Mathieson Alkali Works, Inc.
Metz Co., H. A.
Staley Co., A. E.
Stein, Hall & Co.
Warren Soap Co.

STEAM ENGINES.
(See Engines—Steam.)

STEAM HOSE.
(See Hose—Fire.)

STEAM PUMPS.
(See Pumps—Steam.)

STEAM SEPARATORS.
(See Separators.)

STEAM TRAPS.
(See Traps—Steam.)

STEEL SHELVING, DOORS, WINDOW PARTITIONS, ETC.
Collins, J. D.
Lupton & Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.
Truscon Steel Co.

STENCILS AND STENCIL PAPERS.
(See Stamps and Stencils.)

STENCIL BRUSHES.
(See Marking Pots and Brushes.)

STENCIL CUTTING MACHINES.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

STICKS—PICKER.
(See Picker Sticks.)

STICKERS AND LABELS FOR HOSIERY, BOXES, ETC.
Kirby-Cogeshall Co.

STOOLS.
(See Furniture—Mill.)

STOP WATCHES.
Service Recorder Co.
Silberberg, Mortimer J.

STOP MOTION.
Crompton & Knowles Loom Works.
Draper Corporation.
Eclipse Textile Devices, Inc.
Whitin Machine Works.
Wildman Mfg. Co.

STOKERS.
Westinghouse Elec. & Mfg. Co.

STORAGE RACKS.
(See Shelving.)

STORAGE WAREHOUSE (COTTON).
Piedmont Bonded Warehouse & Compress Co.

STRAPS (LUG, CHECK, HEEL, TUGGER, PICKER HARNESS, ETC.)
Atlanta Harness & Reed Co.
Bond & Co., Chas.
Hayes Loom Harness & Reed Co.
Jacobs Mfg. Co., E. H.
Garland Mfg. Co.

STRAPPING.
(See Leather Specialties or Check Straps.)

STREET LIGHTING FIXTURES.
Cutter Works, George.

SULPHIDES.
(See Finishing & Sizing Materials.)

SULPHUROUS ACID GENERATOR.
Macomb Machine Co.

SUPPLIES—GENERAL MILL.
Dodge Sales & Eng. Co.
Jenkins Bros.
Link-Belt Co.
Lunkenheimer Co.
Morse Chain Co.
Nashville Industrial Corp.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

SWITCHES—KNIFE-ELECTRIC.
Cutter Works, George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

SWITCHBOARDS—PANEL.
Cutter Works, George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

SYSTEMS (BUSINESS.)
Ernst & Ernst.

TABLES—MILL.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.

TALLOW.
(See Finishing Machinery.)

TANKS—OIL, GASOLINE, PAINT, ETC.
Bowser & Co., S. F.

TANKS (ELEVATED.)
Casey-Hedges Co.
Cole Mfg. Co., R. D.
Godfrey Conveyor Co.
Lombard Iron Works.
Walsh & Weidner Boiler Co.
Woolford Wood Tank Co., G.

TANKS (SPRINKLER.)
Cole Mfg. Co., R. D.
Grinnell Co.
Lombard Iron Works.
Woolford Wood Tank Co., G.

TANKS (STEEL STORAGE.)
Cole Mfg. Co., R. D.
Grinnell Co.
Godfrey Conveyor Co.
Lombard Iron Works.
Walsh & Weidner Boiler Co.

TANKS (WOODEN.)
Cocker Mch. & Fdry. Co.
Grinnell Co.
Hightower Box & Tank Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz.
Textile Finishing Mchry. Co.
Woolford Wood Tank Co., G.

TAPE LOOMS—COTTON.
Foster Mch. Co.
Fletcher Works.
Schaum & Uhlinger.

TAPES AND BRAIDS.
American Textile Banding Co., Inc.
Barber Mfg. Co.
Weimar Brothers.

TAPES—SPINNING AND TWISTING.
Barber Mfg. Co.

TAPE MAKING MACHINES.
(See Bandage and Tape Machinery.)

TAPIOCA FLOUR.
Stein, Hall & Co.

TAX SERVICE.
Ernst & Ernst.

TELEPHONE—CALLING SYSTEM.
Carter Electric Co.
General Electric Co.

TEMPERATURE REGULATORS.
Carrier Eng. Corp.
Foxboro Co., Inc.
General Electric Co.
Mates-Brown Co., B. P.
Parks-Cramer Co.
Taylor Instrument Co.

TEMPLES.
Draper Corporation.

TENTERS.
Butterworth & Sons Co., The.
Textile Finishing Mach. Co.

TENTER HOUSING & RECONSTRUCTING SYSTEM.
Proctor & Schwartz, Inc.

TESTERS FOR YARN, FABRIC CORD, ROPE, RUBBER, WIRE, ETC.
Scott & Co., Henry L.

TEXTILE CONSULTING ENGINEERS.
Monaghan, Jas. F.

TEXTILE MACHINERY.
(See Cotton Mill Machinery.)

THEATRE EQUIPMENT.
Southern Theatre Equip. Co.

THERMOMETERS—ANGLE AND STRAIGHT STEM.
Foxboro Co.
Mates-Brown Co., B. P.
Taylor Instrument Co.

THERMOMETERS—RECORDING AND INDEX.
Foxboro Co.
Mates-Brown Co., B. P.
Taylor Instrument Co.

THERMOSTATS.
Foxboro Co.

THIN PLACE PREVENTERS.
Draper Corporation.

THREAD EXTRACTORS.
Brooks & Doxey, Ltd.
Lord Bros.

THREAD GUIDES.
Mitchell-Bissell Co.
Palmer Co., The I. E.

TICKETS (RIDER).
Kirby-Cogeshall Co.

TILE & BRICK.
National Paving Brick Co.

TIMBER.
(See Lumber.)

TIME CLOCKS.
(See Clocks.)

TIERING MACHINES.
Collins, J. D.

TIES—BALING.
(See Bale Ties.)

TIRE FABRIC EQUIPMENT.
Fletcher Works.
Warp Compressing Mch. Co.

TOE STICKERS (HOSIERY).
Kirby-Cogeshall Co.

TOILETS.
Crane Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

No Idle Spindles or Soft Bobbins When Barber Tape is Used

Barber tape is of just the proper weight and construction to insure smooth, steady operation. They had to be perfect, or the name Barber would never have been put on them and the fact that they are preferred is proved by the fact that 90% of new tape drive cotton frames, put on the market in the past ten years have been equipped with Barber Tapes.

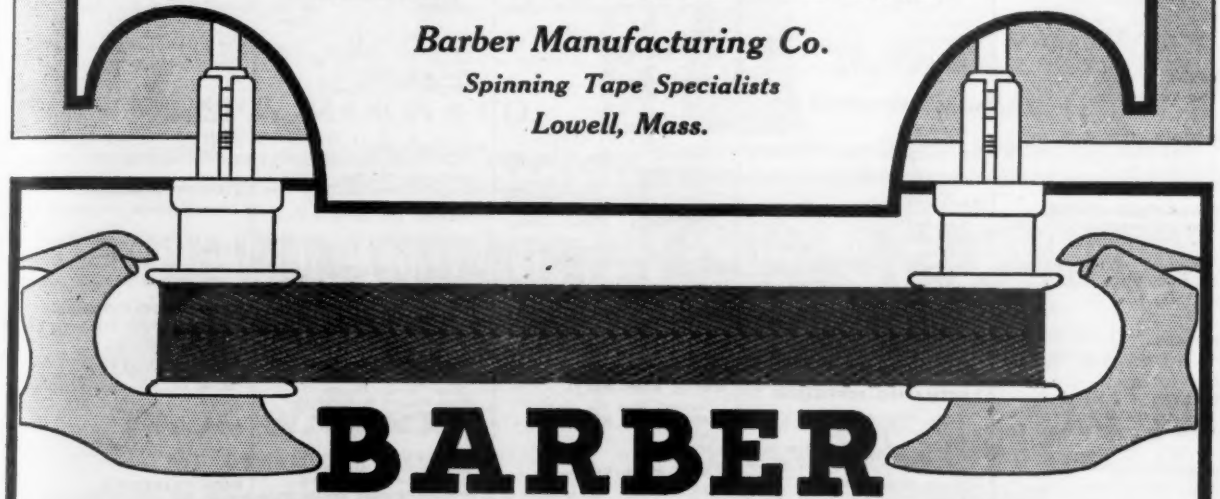
Barber Tapes have the quality of materials, quality of workmanship and a long established reputation to maintain that is assurance to the country's leading textile engineers that they are the best that can be secured.

And Barber service is prompt and satisfying. Write or wire for prices.

Barber Manufacturing Co.

Spinning Tape Specialists

Lowell, Mass.



BARBER

SPINNING AND TWISTING TAPES

Shafts, Pulleys, Hangers, Belting Packing, Lacing

BOILERS

For Mills and Public Works. Low Prices

Tanks, Stacks, Smoke Flues, Boiler Tubes, Pipe, Valves, Fittings, Kerosene and Gasoline Engines, Wood Saws, Pumps, Heaters, Injectors, Engine Supplies and Repairs for Mills, Hotels, Public Works.

Iron and Brass Castings Cast Every Day.

LOMBARD Foundry, Machine, Boiler Works, and Supply Store

AUGUSTA, GEORGIA

TUPELO

THE HARD-WEAR LUMBER

has about every advantage for

TEXTILE MILL FLOORING

Because of its "involved" grain it resists severe friction for lots of profitable years, without slivering or splintering. Get all the facts. Write

SOUTHERN CYPRESS MFRS. ASSOCIATION

805 Poydras Building, New Orleans, La., or
805 Graham Building, Jacksonville, Fla.

SOFT WATER - CLEAR WATER

FOR EVERY PURPOSE

DECALSO ZERO WATER SOFTENERS
LIME AND SODA WATER SOFTENERS
PRESSURE AND GRAVITY FILTERS

SOFTENER

FOR PARTICULARS ADDRESS

AMERICAN WATER SOFTENER CO.

LEHIGH AVE. AT 4TH. ST.

PHILADELPHIA, PA.

FILTER

BYC

TRADE MARK

BARBER - COLMAN COMPANY

Main Office and Factory

Rockford, Ill.

Boston, Mass. Greenville, S. C.

WARP TYING MACHINES

WARP DRAWING MACHINES

HAND KNOTTERS FOR SPOOLING AND WINDING

BUYERS' INDEX—Continued.

TOILET PARTITIONS.
Lupton's Sons Co., David.
Manufacturing Equip. & Eng'g Co.
Sanymetal Products Co.

TOOL CABINETS—STEEL.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.

TOOL STANDS—STEEL.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Royal Metal Mfg. Co.

TOWERS.
(See Tanks—Elevated.)

TRACTORS—ELECTRIC, INDUSTRIAL.
Collins, J. D.

TRANSMISSION—POWER.
(See Power Transmission Machinery.)

TRAPS—RETURN STEAM.
Morehead Mfg. Co.

TRIPTODS.
U. S. Bobbin & Shuttle Co.

TROLLEYS & HOISTS.
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Machy. Co.

TRUCKS—AUTO.
White Co.

TRUCKS, BASKETC, ETC.
Keystone Fibre Co.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
Standard Fibre Co.

TRUCKS—ELECTRIC—INTER.
Collins, J. D.

TRUCKS—HAND AND ELEVATING.
Collins, J. D.

TRUCKS—INTER, ETC.
Keystone Fibre Co.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
Standard Fibre Co.

TUBS.
(See Tanks—Wooden.)

TUBING—METAL.
Youngstown Sheet & Tube Co.

TURBINES—HYDRAULIC.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

TURBINES—STEAM.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

TWISTING MACHINERY AND SUPPLIES.
Barber Mfg. Co.
Draper Corporation.
Foster Mch. Co.
Howard & Bullough.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
U. S. Bobbin & Shuttle Co.
Whitin Machine Works.

TYPEWRITERS.
Smith & Bros. Typewriter Co.

URINALS.
Crane Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

UNIONS—BRONZE.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

VACUUM PANS.
Cresson-Morris Co.

VALVES—ANGLE, GLOBE, CROSS, BLOW-OFF, CHECK, GATE, POP-SAFETY, ETC.
Crane Co.
Grinnell Co.
Jenkins Bros.
Lunkenheimer Co.

VALVES—NON-RETURN STOP.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

VARNISHES.
Barrett Co.
Hockaday Co.
Johnson & Co., Inc., Oliver.
Wadsworth, Howland & Co., Inc.
Ware Paint Co.

VATS.
(See Tanks—Wooden.)

VENTILATING APPARATUS.
Bayley Mfg. Co.
Buckeye Blower Co.
Carrier Eng. Corp.
General Electric Co.
Grinnell Co.
Houch Shade Corp.
Parks-Cramer Co.
Philadelphia Drying Mchy. Co.
Sarsent's Sons Co., C. G.
Tolhurst Machine Co.
Walker Electric & Plbg. Co.

VENTILATING & HEATING CONTRACTORS.
Walker Electric & Plbg. Co.

VENTILATING WINDOW SHADES.
Hough Shade Corp.

VILLAGE ARCHITECTS AND DESIGNERS.
Robert & Co.
Sirrine, J. E.
Stuhrman, Edw. A.

VILLAGE HOUSES.
(See Houses—Ready-Built.)

WAGON AND CAR UNLOADERS.
Curtis Pneumatic Mchry. Co.

WAREHOUSE (COTTON STORAGE).
Piedmont Bonded Warehouse & Compress Co.

WAREHOUSE—PORTABLE.
(See Buildings.)

WAREHOUSE DOOR HARDWARE.
(See Doors and Hardware.)

WAREHOUSE TRUCKS.
(See Trucks.)

WARP COMPRESSING MACHINES.
Warp Compressing Mch. Co.

WARP DRAWING MACHINE.
Barber-Colman Co.
Crompton & Knowles Loom Works.
Warp Compressing Mch. Co.

WARPERS AND WARPING MACHINERY AND SUPPLIES.
Auto Creel Corp.
Barber-Colman Co.
Brandwood, John.
Brooks & Doxey, Ltd.
Cocker Mch. & Fdry. Co.
Draper Corporation.
Foster Mch. Co.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Suter, Alfred.
U. S. Bobbin & Shuttle Co.
Warp Compressing Mch. Co.

WASH BASINS.
(See Lavatories.)

WASHERS—CLOTH.
American Laundry Mchry. Co.
Butterworth & Sons Co., H. W.
Hunt Machine Co., Rodney.
Klauder-Weldon Dyeing Mch. Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Mchry. Co.
Tolhurst Mch. Wks.

WASHING POWDERS—FLOOR.
India Alkali Works.

WASTE BINS—STEEL.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.

WASTE MACHINERY—COTTON.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Logemann Bros.
Rex. Eng. Corp.
Saco-Lowell Shops.
Sarsent's Sons Corp., C. G.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Co.

WATCHES (TIME & STOP.)
Service Recorder Co.
Silberberg Co., Mortimer J.

WATCHMAN CLOCKS.
(See Clocks—Watchman.)

WATER COOLERS—FOUNTAIN.
Crane Co.
Manufacturing Equip. & Eng'g Co.
Rundle-Spence Mfg. Co.
Miles Refrigerating Co.
Taylor, Halsey W.

WASTE SEPARATORS.
(See Separators.)

WATER SOFTENERS AND PURIFIERS.
American Water Softener Co.
Norwood Engineering Co.
Scaife & Sons Co., Wm. B.

WATER SUPPLY SYSTEMS.
Hughes Specialty Well Drilling Co.
Sydnor Pump & Well Co., Inc.

WATER TOWERS.
(See Tanks—Elevated.)

WATERPROOFING MACHINERY.
Butterworth & Sons Co., H. W.
Textile Finishing Machinery Co., The.

WEAVING.
(See Yarn Manufacturers.)

WELDING APPARATUS—ELECTRIC ARC.
Bird-Potts Co., Inc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

WELDING APPARATUS AND SUPPLIES—OXY-ACETYLENE.
Bird-Potts Co., Inc.
Commercial Acetylene Supply Co.
Oxweld Acetylene Co.
Standard Gas Products Co.

WELDING—JOB.
Bird-Potts Co., Inc.
Briggs-Shaffner Co.
Grinnell Co.
Standard Gas Products Co.

WELFARE ARCHITECTS.
(See Village Architects.)

WELFARE EQUIPMENT.
American Laundry Mchry. Co.
Crane Co.
Cutter Works, George.
Dixie Culvert & Metal Co.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Rundle-Spence Mfg. Co.
Sherma nService, Inc.
Southern Theatre Equip. Co.
Taylor, Halsey W.
Westinghouse Elec. & Mfg. Co.

WELL DRILLING.
Hughes Specialty Well Drilling Co.
Sydnor Pump & Well Co., Inc.

WHEELS—FIBRE.
(See Fibre Products.)

WHEEL PULLER.
General Electric Co.

WHIP HOISTS.
Mason, Volney W.

WHISTLES—STEAM AND AIR.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

WHISTLES—ELECTRIC SIREN.
Federal Electric Co.

WHIZZERS.
Fletcher Works.
Tolhurst Mach. Wks.
Schaum & Uhlinger.

WINDERS.
Brooks & Doxey, Ltd.
Firschine, J. A.
Foster Mch. Co.
Howard & Bullough American Machine Co.
Lord Bros.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Universal Winding Co.

WINDOW FRAMES AND SASH—STEEL.
Knapp Fence Co.
Lupton's Sons Co., David.
Truscon Steel Co.

WINDOW SASH—STEEL.
Knapp Fence Co.
Lupton's Sons Co., David.

WINDOW SHADES.
Hough Shade Corp.

WIRES—DROP.
(See Drop Wires.)

WIRE FENCING, PARTITIONS & MACHINERY GUARDS.
Anchor Post Iron Works.
Knapp Fence Co.

WIRE HEDDLES.
(See Heddles.)

WIRING CONDUITS AND FITTINGS.
(See Electric Machinery and Supplies.)

WIRING—ELECTRICAL.
(See Electrical Contractors.)

WOOD.
(See Lumber.)

WOOD BLOCK FLOORING.
Southern Wood Preserving Co.

WOOD BEAM HEADS.
Allen Co.

WOOD BOXES.
(See Packing Cases.)

WOOD PRESERVER.
American Cement Paint Co.
Barrett Co.
Dixon Crucible Co., Jos.
Johnson & Co., Inc., Oliver.
Ware Paint Co.
Wadsworth, Howland & Co., Inc.

WOOD PULLEYS.
(See Pulleys.)

WOOD ROLLS.
Washburn & Sons, L. R.

WOOD TANKS.
(See Tanks.)

WOOLEN MACHINERY.
Butterworth & Sons Co., H. W.
Crompton & Knowles Loom Works.
Schofield Co., Wm.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Smith & Furbush Mach. Co.
Textile Finishing Mchry. Co.
Tolhurst Machine Works.
Whitin Machine Works.

YARN MANUFACTURERS.
Aberfoyle Mfg. Co.
American Yarn & Processing Co.
Arkray Mills, Inc.
Arlington Cotton Mills.
Arrow Mills, Inc.
Boger & Crawford.
Callaway Mills, Inc.
Dixie Mercerising Co.
Flint Mfg. Co.
Florsehim, H. A.
Gray Mfg. Co.
Hunter Mfg. & Comm. Co.
Myrtle Mills, Inc.
Parkdale Mills, Inc.
Philadelphia Felt Co.
Southern Yarn Co.
Tolar & Hart.
Weimar Bros.

YARN DEALERS AND COMMISSION MERCHANTS.
(See Cotton Yarn and Cloth Commission Merchants and Dealers.)

YARN DRYERS.
(See Dryers.)

YARN DYERS.
(See Dyers.)

YARN TESTERS.
Scott & Co., Henry L.

MASON'S Whip Hoists

Wool, Cotton, Hay, Coffee, Hides, etc. Either by Outrigger or Through Hatchways.

ROYAL WEAVING CO., PAWTUCKET, R. I.

Volney W. Mason & Co. Nov. 3rd, 1922.
Providence, R. I.

Gentlemen:

Regarding your Whip Hoist, we think this is the greatest thing out for loading and unloading cases or any kind of heavy merchandise. We would not be without it.

It is a labor-saving device and two men can handle most any kind of heavy work, either loading or unloading, in a short time.

The apparatus wants hardly any attention, and is ready to do its work at any time.

Any concern who can use anything of this sort will not make a mistake in buying your Whip Hoist.

Yours very truly,
Dic. Jos. Ott /ML Royal Weaving Company

VOLNEY W. MASON & CO.

1860 PROVIDENCE, R. I., U. S. A. 1923

Elevated Tanks
Boilers, Engines
Castings
Hosiery Dye
Machines

R. D. Cole Mfg. Co.
Newnan, Ga.

ELECTRIC WIRING CONTRACTOR

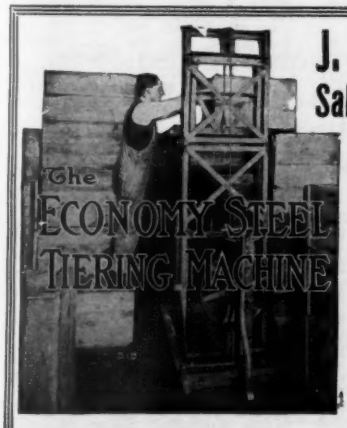
LIGHT POWER

PAUL W. CURTIS
Chattanooga, Tenn.
TEXTILE WORK A SPECIALTY

Liquid EBG Chlorine

Our container equipment includes 100 and 150 pound Cylinders, Ton Drums, and Tank Cars.

Electro Bleaching Gas Co.
PIONEER MANUFACTURERS of LIQUID CHLORINE
Plant: NIAGARA FALLS, N.Y.
Main office 18 East 41st Street New York. Chicago office 11 So. La Salle St.



J. D. Collins
Sales & Eng'g. Co.

STORAGE AND INDOOR TRANSPORTATION EQUIPMENT
55½ Luckie St.
Atlanta, Ga.

Equipment that will reduce your storage and handling expenses. Tiering Machines, Electric and Hand Trucks, Overhead Carriers, Gravity and Power Conveyors of all kinds.

Catalogs and full information furnished upon request

Carrier Engineering Corporation
750 FRELINGHUYSEN AVE., NEWARK, N. J.
Boston Buffalo Philadelphia Chicago New York

AIR CONDITIONING
(Manufactured Weather)

HUMIDIFICATION CLEANING
WINTER HEATING SUMMER COOLING

We will be glad to tell you why and how nearly two hundred of the finest mills in the U. S. are making "Every day a *good* day" with.

CARRIER EQUIPMENT

SYDNOR'S SUPREME SERVICE

WELL DRILLING
and DEEP WELL PUMPS

We do the engineering and have been solving water problems satisfactorily for 25 years for textile mills.

SYDNOR PUMP & WELL CO., INC.,
Richmond, Va.

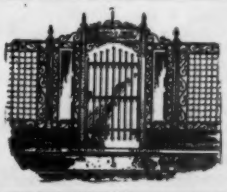
H. S. W. D. CO. DRILLED A WELL SKILLED-WELL WORK-WELL DONE SERVICE MEN-WELL CONTRACTORS

WELLS

HUGHES SPECIALTY
WELL DRILLING CO.
CHARLESTON ATLANTA

Established 1865

ADVERTISING is an economy and cuts the cost of selling, making lower prices or better goods possible without sacrifice of the sellers' profits.



WIRE RAILINGS
WINDOW GUARDS
WIRE CLOTH
Established 1835.
DUFUR & CO.
309 N. Howard St. Baltimore, Md.

Advertisers' Index

Aberfoyle Mfg. Co. 266-R
Alabama Power Co. 19
Aldrich Machine Works.... 268
Allen Company ..... *
Allis-Chalmers Mfg. Co..... 10
American Audit Co...281 and 287
American Cement Paint Co.. 265
American Laundry Machinery Co. 269-R
American Machine Co., H. & B. 211-R
American Moistening Co. ..207-R
American Scrubbing Equipment Co. 259
American Supply Co. 262
American Textile Banding Co., Inc. 256-R
American Water Softener Co 293
American Yarn & Processing Co. 277
Anchor Post Iron Works ...220-R
Arkray Mills, Inc. 274
Arlington Cotton Mills 274
Arnold, Hoffman & Co. ... 249
Arrow Mills, Inc. 274
Atlanta Brush Co. 260
Atlanta Harness & Reed Mfg. Co. 242-R
Atlanta Rubber Stamp & Stencil Works 274
Atlanta & West Point R. R.. 280
Auto Creel Corp. 258

Barber-Coleman Co....23 and 293
Barber Mfg. Co. 293
Barrett Co. 209-R
Bayley Mfg. Co. 265
Beer Co., H. & B..... 276
Belger Co. ..... *
Birmingham Slag Co. ..... *
Bird-Potts Co. 270
Bliss, Fabyan & Co. 275
Boger & Crawford 276
Bond & Co., Chas. 213-R
Borne, Scrymser Co. 251
Bosson & Lane 252
Bowser & Co., S. F., Inc... 41
Bradley Mfg. Co., A. J.....256-R
Brandwood, John 56
Briggs-Schaffner Co. 291
Brinton Co., H. 264-R
Brooks & Doxey (1920) Ltd. 18
Buckeye Blower Co. 224-R
Butterworth & Sons Co., H. W. 51

Callaway Mills, Inc. 276
Carlyle-Johnson Machine Co. 268
Carrier Engineering Corp... 295
Carter Electric Co. 270
Carver-Beaver Yarn Co.... 274
Casey-Hedges Co. 272
Central Dyestuff & Chemical Co. 242-R
Central of Georgia Railway. 34
Chisholm-Moore Mfg. Co... 273
Ciba Co., Inc. 247
Classified Opportunities 282—283
Cocker Machine & Foundry Co. 248
Cole Mfg. Co., R. D. 295
Collins, J. D. 295
Commercial Acetylene Supply Co. 238-R
Cooper- Hewitt Electric Co. *
Cooper & Griffin 279
Corn Products Refining Co.. 52
Cortright Metal Roofing Co. 287
Crane Co. 14
Cresson-Morris Co. 270
Crompton & Knowles Loom Works 253
Curtis, Paul W. 295
Curtis Pneumatic Machinery Co. 271
Cutter Works, George 11

D-A Lubricant Co. ..... *
Davis, Roger W. 9
Dixie Culvert & Metal Co... *
Dixie Portland Cement Co.. 268
Dixie Mercerizing Co. 259-R
Dixon Crucible Co., Jos....238-R
Dodge Sales & Eng. Co. .. *
Draper Corporation 3
Dufur & Co. 295
Durant Mfg. Co. 262

Eclipse Textile Devices ... 28
Economy Baler Co. 287
Electric Smelting & Aluminum Co. 251
Electro Bleaching Gas Co... 295
Emmons Loom Harness Co.. 289
Ernst & Ernst 218-R

Fafnir Bearing Co. 6
Fawcett, Hughes 278
Federal Electric Co. ..... *
Firshing Co., J. A. 242-R
Fletcher Works 53
Flint Mfg. Co. 274
Florsheim, H. A. 274
Ford Co., J. B. 251
Foster Machine Co. 22
Foundation Co., The ..... *
Foxboro Co. 50
Franklin Process Co. 2

Gallaudet Aircraft Corp'n.. 287
Garland Mfg. Co. 238-R
General Electric Co. ..... *
General Machine Works ...262-R
Georgia Railroad 280
Georgia Railway & Power Co. ..... *
Godfrey Conveyor Co. 272
Goulds Mfg. Co. 291
Grasselli Chemical Co. 249
Gray Mfg. Co. 274
Greist Mfg. Co. 24
Grinnell Co. ..... *

Hayes Loom Reed & Harness Co. 262
Hemphill Co. 254-R
Hightower Box & Tank Co.. 32
Hockaday Co. 36
Hopedale Mfg. Co. 257
Hotel Cecil 281
Hotel Tuller 280
Hough Shade Corp. 242-R
Howard & Bullough Amer. Mach. Co. 211-R
Hughes Specialty Well Drilling Co. 295
Hunt Machine Co., Rodney. *
Hunter Mfg. & Comm. Co.. 46
Huntington & Guerry, Inc. .. 269
Hyatt Roller Bearing Co. .....62 and 297

India Alkali Works 285
International Eng'g Works. 12
Ivanhoe-Regent Works of G. E. Co. ..... *

Jacobs Mfg. Co., E. H. ... 287
Jacobs & Co. 58
Jenkins Bros. 273
Johnson & Co., Oliver 38
Jordan Mfg. Co. 213-R

Kali Mfg Co. 54
Keever Starch Co. 250
Keystone Fibre Co. 259
Kirby-Cogeshall Co. 256-R
Klauder-Weldon Dyeing Mach. Co. 246
Knapp Fence Co. 234-R

Lamson Oil Co. 266
Lane & Co., J. H. 278
Lennig & Co., Chas. 250
Lestershire Spool & Mfg. Co. 254
Lewis Co., G. B. ..... *
Link-Belt Co. 300
Lockwood, Greene & Co. .. 39
Logeman Bros. 31
Lombard Fdry. & Mach. Wks. 293
Lord Bros. 18
Lowell Crayon Co. 263
Lunkenheimer Co. 13
Lupton's Sons Co., David.. 291
Lyon Metallic Mfg. Co. ... 261

Macomb Machine Co. 246
Manufacturing Equip. & Eng'g Co. 263
Mason, Volney W. 295
Masury-Young Co. 289
Mates-Brown Co., Inc., B. P. *
Mathieson Alkali Works, Inc. 55
Merrow Machine Co. 262-R
Metz Co., H. A. 228-R
Miles Refrigerating Co. ... 4
Mitchell-Bissell Co. 1
Monaghan, Jas. F. 299
Monroe Calculating Machine Co. 232-R
Morehead Mfg. Co. 287
Morse Chain Co. 42
Mossberg Pressed Steel Corp. 255
Murray Company, The 17
Myrtle Mills, Inc. 274

Nashville Industrial Corporation 283
National Aniline & Chemical Co. 60
National Paving Brick Co.. *
National Shawmut Bank .. 291
New York & New Jersey Lubricant Co. 271
Norwood Engineering Co... 248

Oxweld Acetylene Co. 222-R

Palmer Co., I. E. 260
Parker Co., Walter L. ... 255
Parks-Cramer Co. 16
Parkdale Mills, Inc. 274
Pearson, Jos. T. 262-R
Phila. Drying Machinery Co. 247
Philadelphia Felt Co. 252
Piedmont Bonded Warehouse & Compress Co., Inc.... 279
Proctor & Schwartz, Inc... 248

Re-Fil-It Broom Mfg. Co... 33
Reliance Machine Works...262-R
Renold, Inc., Hans 291
Rex Engineering Corp. ... 29
Rhoads & Sons, J. E. 271
Robert & Co. 37
Roessler & Hasslacher Chemical Co. .....230-R and 240-R
Rohm & Haas Co. 250
Ross-Gould Co. 264
Royal Metal Mfg. Co. 256-R
Rundle-Spence Mfg. Co. .. 265

Saco-Lowell Shops 9
Sandoz Chemical Co. 245
Sanymetal Products Co. ...236-R
Sargent's Sons Corp., C. G.. 253
Sayles Finishing Plants, Inc. 47
Scaife & Sons, Wm. B. 287
Schaum & Uhlinger 53
Schofield's Sons Co., J. S.. 285
Schofield Co., Wm. 291
Scott & Co., Henry L. ... 261
Scott & Williams, Inc. 245-R
Service Recorder Co. 263
Shambow Shuttle Co. 258
Sherman Service, Inc. ... 27
Showalter Printing Co., A. J. 264
Silberberg Co., Mortimer J. 260
Sirrine Co., J. E. 35
Skayef Ball Bearing Co.... 5
Smith & Furbush Machine Co. 26
Smith & Bros. Typewriter Co., L. C. 264
Sonneborn Sons, Inc., L. .. *
Southern Cypress Mfg. Asso. 293
Southern Railway System.. *
Southern Spindle & Flyer Co. *
Southern Theatre Equip. Co. 30
Southern Wood Preserving Co. 236-R
Southern Yarn Co 278
Southwestern Broom Mfg. Co. 264
Stafford Co. 8
Staley Mfg. Co., A. E..... 57
Standard Fibre Co. 285
Standard Gas Products Co.. 270
Steel Heddle Mfg. Co.....218-R
Stein, Hall & Co. 48
Stuhrman, Edw. A. 226-R
Surpass Chemical Co 245
Suter, Alfred 258
Sydnor Pump & Well Co... 295

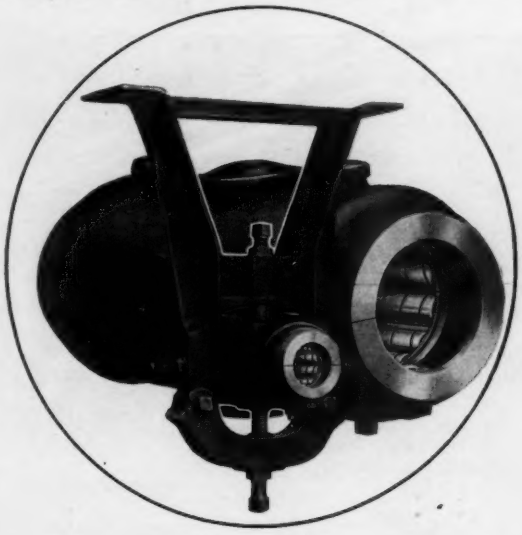
Taylor Co., Halsey W. ... 263
Taylor Instrument Co. ... 245
Terrell Machine Co. 234-R
Texas Co. 40
Texas & Pacific Railway... 281
Textile Finishing Machinery Co. 298
Tennessee Electric Power Co. .....20 and 21
Thompson & Binger, Inc... *
Tolar & Hart 275
Tolhurst Machine Works..215-R
Toomey, Frank, Inc. 282
Torrington Co., The 260-R
Transmission Ball Bearing Co. 269
Trump Bros. Machine Co...264-R
Truscon Steel Co. 7

United Chemical Products Co. 59
United Piece Dye Works.. 49
Universal Winding Co. 246-R
U. S. Ball Bearing Co. ... 45
U. S. Bobbin & Shuttle Co..216-R

Vermont Spool & Bobbin Co. 256
Vogel Co., Jos. A. 266

Wadsworth, Howland & Co., Inc. ..... *
Walke Box Co. 256-R
Walker Electric & Plumbing Co. 267
Walsh & Weidner Boiler Co. 272
Want Ads 282
Ware Paint Co. 291
Warp Compressing Machine Co. 25
Warren Soap Mfg. Co.....238-R
Washburn & Son, L. R. ... 257
Weimar Bros. 274
Wellington, Sears & Co. .. 277
Westinghouse Electric & Mfg. Co. 11
White Co. ..... *
Whitin Machine Works.... 15
Whitinsville Spinning Ring Co. 254
Wildman Mfg. Co. 252-R
Williams & Sons, I. B..... 43
Williams Co., J. H. 256
Wolf & Co., Jacques 252
Wood's Sons Co., T. B. ... 44
Woodward, Baldwin & Co. .....274 and 278
Woolford Wood Tank Mfg. Co., G. 291

Youngstown Sheet & Tube Co. 267



They're Up To The Minute After 32 Years of Dependable and Economical Service

—Hyatt Line Shaft Roller Bearings—

Thirty-two years ago, in 1890, the first Hyatt roller bearings for line shafts were made and some of them were installed in the plant of the Greenfield Tap and Die Corporation.

These old Hyatt line shaft bearings are still saving power, saving oil, saving maintenance at Greenfield, just as capably as the newest bearing made this morning.

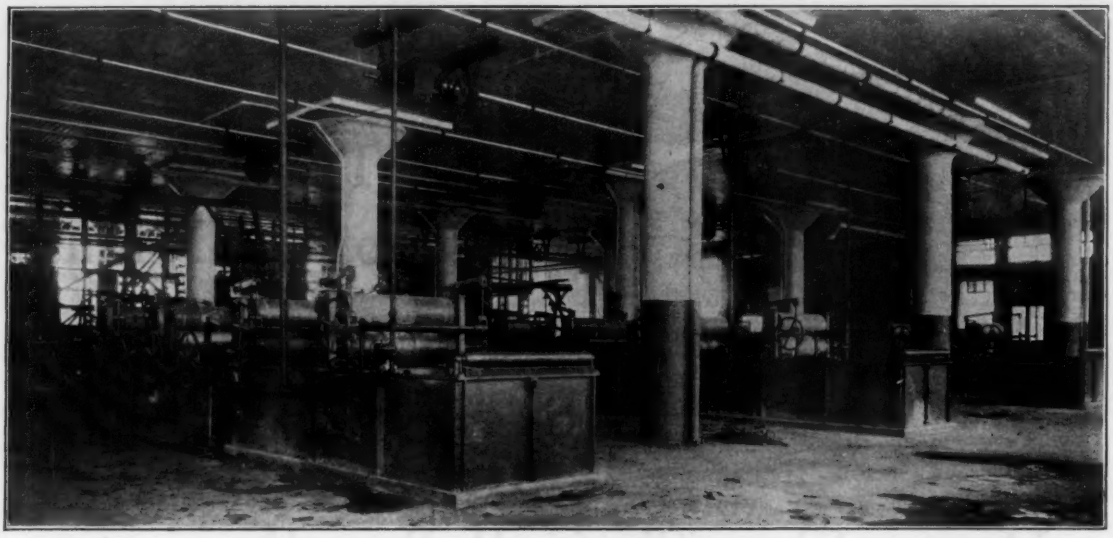
Carefully improved throughout the years in material and construction but never changed in principle—the true rolling motion of the Hyatt roller with its inbuilt self oiling system—the logical, the tried, the proven line shaft bearing.

Operation records for Hyatt line shaft bearings vary from 20 to 32 years and all still going strong—tests show 14.1% to 27.2% total power saved—lubrication costs reduced 85%—maintenance nothing!

Don't attempt to make low production cost records if you are still losing power and oil through the use of old fashioned, plain bearings. Specify Hyatt line shaft bearings—it pays.

Hyatt Roller Bearing Company
Newark, N. J.
Distributors Everywhere

***Split throughout!** The box and the roller assembly of Hyatt line shaft bearings are split in two equal sections making it easy to install them without taking down line shafting or removing pulleys, collars and couplings. Obtain the box, apply, close the box—they're off to save power, lubrication and maintenance.*



THE ILLUSTRATION ABOVE SHOWS THE ENTERING END OF THREE INDIGO WARP DYEING RANGES RECENTLY INSTALLED IN A SOUTHERN COTTON MILL. THE RANGES FOR WARPS CONSIST OF THREE BOILING-OUT MACHINES, DYEING MACHINES, WASHING MACHINES, COMPENSATORS, DRYERS AND COILERS.

YARN FINISHING MACHINES:

SLASHERS
WARP DRYERS
WARP DYEING MACHINES
WARP MERCERIZERS
WARP SPLITTERS
WARP BOILING-OUT MACHINES

CLOTH FINISHING MACHINES:

SINGERS
KIERS
SCUTCHERS
MANGLES
PADDERS
DRYERS
DYEING MACHINES
TENTERS
AGERS
COLOR KETTLES
SPRINKLERS
CALENDERS

MAIN OFFICE AND WORKS
PROVIDENCE, R. I.

NEW YORK OFFICE
30 CHURCH ST.

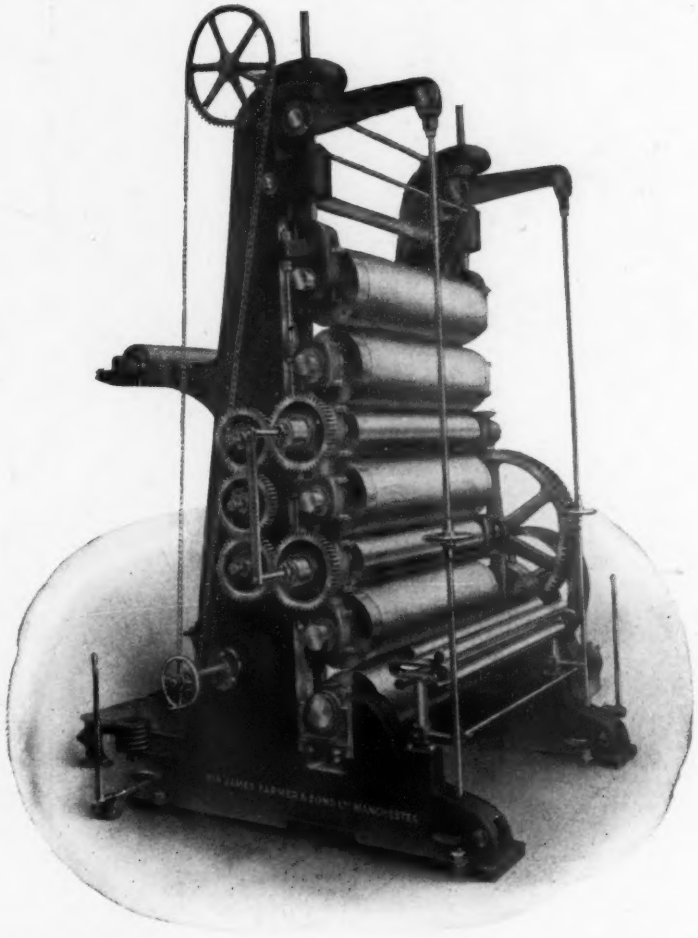
THE TEXTILE-FINISHING MACHINERY CO

CANADIAN REPRESENTATIVE
WHITEHEAD ENMANS, Ltd.
MONTREAL

SOUTHERN REPRESENTATIVE
H. G. MAYER
CHARLOTTE, N. C

Sir James Farmer Norton, Ltd.

Salford, Manchester, England.



OPEN-SIDED CALENDER WITH SEVEN BOWLS

This open-frame type of Calender has been specially designed for customers who prefer the open-sided Calender because it affords a quicker and more convenient means of changing any individual bowl. The changing of the bowl can be rapidly effected without disturbing the other bowls by removing the loose caps which secure it in the bearings. The frame and bearings are so constructed that the Calender is equal in strength and easy running to one of the closed-frame type.

The Bowls may be arranged to suit the styles of finishes it is desired to produce. The Calender illustrated has a bottom iron bowl, two heated chilled-iron bowls geared together by spur wheels to prevent slipping, and four cotton bowls. The cotton bowls, which are an important factor in the successful working of a Calender, are of our own construction, made and suitably pressed by skilled workmen of long experience, the cotton employed being the best Egyptian cop bottoms, and the bowls being ground to a perfect finish on a special machine of the most modern type.

The Compound Levers are fitted with cam relieving motion at the bottom for taking the pressure off the bowls, and with cam relieving motion at the top for supporting the levers when lifting the bowls, this motion being conveniently worked by chain and chain wheels from below.

The Top Screws are supplied with worm-wheel parallel setting-down gear enclosed in a chamber as a protection from dirt and conveniently actuated by hand from floor level by means of chain and chain wheels as shown on illustration.

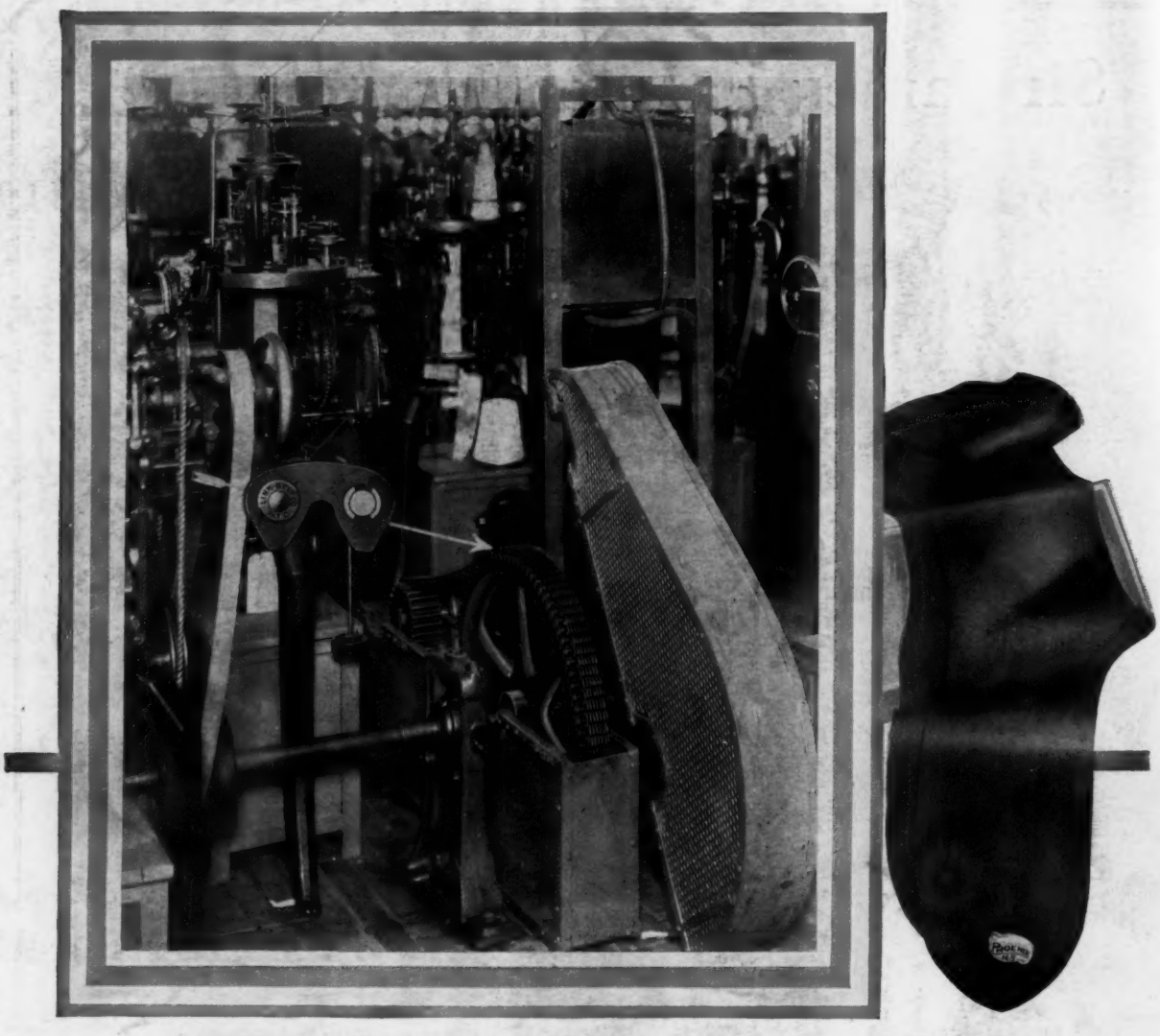
The Calender, which is furnished with all the accessories for staving, let-off, batching and chasing, may be driven by electric motor, steam engine, belt or rope with friction clutch, as shown on illustration, with the addition of fast-and-slow-speed gear where required.

James F. Monaghan

Consulting Engineer

Representative for United States and Canada

52 CHAUNCY STREET **BOSTON, MASS.**



—AND AT THE HOME OF PHOENIX HOSIERY

HERE, as in many other plants, Link-Belt Silent Chain Drives serve several purposes. They save power, save time and increase production. And of even greater importance—they improve the product.

The drive is positive; there is no slippage. All the power of the motor is delivered to the machine, smoothly and uniformly. This not only results in greater output and elimination of waste, but makes a better product. Link-Belt Silent Chain is "Flexible as a Belt—Positive as a Gear—More Efficient than Either."

No matter what your product may be, Link-Belt Silent Chain can accomplish similar results in your plant.

1043

PHILADELPHIA CHICAGO LINK-BELT COMPANY TORONTO INDIANAPOLIS

New York - - Woolworth Bldg.	Wilkes-Barre - - 2d Nat'l Bank Bldg.	Seattle - - 820 First Avenue, S.	Atlanta, Ga., 610-11 Citizens and Southern Bank Bldg.
Boston 9 - - 49 Federal St.	Huntington, W. Va. Robson-Prichard Bldg.	Portland, Ore. - - - 101 First St.	Louisville, Ky. - Frederick Wehle, Starks Bldg.
Pittsburgh - - 3501 Park Bldg.	Cleveland - - - 429 Kirby Bldg.	San Francisco - - 168 Second Street	New Orleans - C. O. Hine, 504 Carondelet Bldg.
St. Louis - Central Nat'l Bank Bldg.	Detroit - - - 4210 Woodward Ave.	Los Angeles - 163 N. Los Angeles St.	Birmingham, Ala., S. L. Morrow, 720 Brown-Marx Bldg.
Buffalo - - 547 Ellicott Square	Kansas City, Mo. - - 306 Elmhurst Bldg	Denver Lindroth, Shubart & Co., Boston Bldg.	Charlotte, N. C. J. S. Cothran, Com'l Bank Bldg.

Canadian Link-Belt Co., Ltd., Toronto and Montreal H. W. CALDWELL & SON CO., CHICAGO NEW YORK, Woolworth Bldg. DALLAS, TEXAS, 709 Main St.

LINK-BELT
SILENT CHAIN DRIVES